



Diet Modification as a Dental Extraction Adjunct in a Diabetic Patient: A Case Report

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Abstract: Dental extractions may be deferred in uncontrolled diabetic patients until their blood glucose level is under control, thereby delaying treatment and compromising quality patient care. Here we present the case of a sixty-year-old man with uncontrolled diabetes who required dental extraction. After a number of failed attempts at starting the procedure due to high random blood glucose levels, a low glycemic index diet was prescribed based on easy instructions and a local, inexpensive meal. This successfully brought his blood glucose under control, and the procedure was successfully completed without complications. This case highlights how dentists can deliver quality patient care by integrating disciplines related to both prevention and treatment. Dietary guidelines for systemically ill patients undergoing specific dental treatments would be highly desirable to help expedite their recovery.

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Introduction

One in five adults in Saudi Arabia suffers from type 2 diabetes mellitus (DM)[1]. Many DM patients are non-compliant with treatment and suffer the side effects of prolonged and uncontrolled hyperglycemia. Uncontrolled DM delays wound healing and predisposes the patient to infections[2, 3]. The American Society of Anesthesiologists (ASA) classifies poorly controlled DM as ASA III, i.e., a patient with severe systemic disease, and it is regarded as a “yellow flag” such that any elective surgical dental treatment should be deferred until blood glucose levels are lowered[4]. The treating dentist must therefore reinforce the importance of medication

adherence and counsel the patient on dietary modifications to improve their diabetes.

Case Presentation

A sixty-year-old man presented with several dental diseases including stage III grade B periodontitis with mucogingival involvement[5], extensive carious lesions in several teeth, coronal leakage in several endodontically treated teeth, and a chronic apical abscess and osteomyelitis associated with a root canal-treated tooth. After a senior (final year) dental student made the diagnosis under the supervision of a senior consultant, a treatment plan was devised to best meet the patient’s needs. Several teeth were deemed “hopeless”, and the patient was scheduled for extraction (**Figure 1A**).



Figure 1. (A) Orthopantomographic radiograph at the initial visit prior to treatment plan. Hopeless tooth to be extracted shown by arrow. (B) One week post-operatively, healing socket (arrow).

The patient also had hypertension and type 2 DM, for which he was taking metformin in 250mg and sitagliptin in 100mg twice daily. Despite this medication, the patient frequently presented with random blood glucose readings $>300\text{mg/dL}$ even though his Hb A1c was 6.7% (normal range 4.5-7). For this reason, extraction was postponed three times, delaying the procedure by a month due to the high random blood glucose levels before the scheduled extraction. Restoration of the subsequent edentulous spaces was similarly delayed.

On the second scheduled extraction visit, the patient was referred to the treating physician who reiterated the importance of diet control and the importance of taking the medications. Despite this, the patient still had a blood glucose level of 313mg/dL on the third scheduled extraction visit, so treatment was again delayed. At this point a decision was taken to counsel the patient about their diet in a more direct and instructive manner. The extraction was re-scheduled for the following week with instruction to eat a Saudi Arabian bean-based dish (Foual Medames) every evening for the three days preceding the appointment. The patient was told to eat until full, use extra virgin olive oil, and eat the meal with brown bread. This diet was selected based on the experience of the senior consultant, who is dual qualified in nutrition, as an adjunct low glycemic index dinner to maintain a steady glucose level for a prolonged period of time. We reasoned that a low glycemic index diet would help lower the blood glucose levels sufficiently for the extraction to proceed. At the fourth scheduled visit, the patient confirmed that he had complied with the diet and the blood glucose level was 161mg/dL . Extraction was successfully completed, and the patient was healing well one week later (**Figure 1B**).

Discussion

Uncontrolled diabetes is a concern during any elective surgical procedure because it significantly affects healing and the immune system. It is clear that perioperative hyperglycaemia (blood glucose concentrations $>140\text{--}180\text{mg/dL}$) increases postoperative surgical complications for various surgeries[6]. Advanced glycation end-products (AGEs) are the result of prolonged uncontrolled hyperglycemia and adversely affect many important proteins implicated in healing such as immunoglobulins and collagen[7]. Despite the recent shift in medical and dental education to behavior modification-based practice, dentistry remains heavily dependent on interventional and hands-on treatment. Dental schools inadvertently emphasize expedience at the expense of quality patient care, subconsciously and negatively encouraging students to spend little or no time on prevention and behavior modification and

focus solely on treatment (drill-and-fill). Although most dental students complete a module on nutrition prior to graduating, little emphasis is given on integrating the acquired knowledge into clinical practice. Therefore, concepts such as the glycemic index and the control of diabetes are studied but not always used.

Here we relied on the glycemic index concept for blood glucose control. A low glycemic index diet leads to the very slow and controlled release of glucose from ingested food. Low glycemic index foods are typically less refined, such as brown bread, brown pasta, and brown rice. Pulses and legumes lower blood glucose levels particularly well by indirectly affecting the satiety center in the brain, which leads to the individual feeling fuller and subsequently eating less[8]. Furthermore, such low glycemic index foods increase the response of glucose receptors in cells and reduce glucose resistance, which is a major pathogenetic mechanism of hyperglycemia[9].

In our case we evaluated the patient as a whole and profiled him in such a way that enabled us to provide him with simple and easy-to-complete instructions. The patient was from a low socio-economic group and, although eager to follow guidelines, expressed his inability to understand fully what a low glucose diet entailed other than “removing sugar from drinks such as coffee and tea”. However, the prescription of a typical dish eaten in the evening for three days prior to extraction was clear and easy to follow. Furthermore, it took the patient’s social history into account, as it is one of the cheapest and most popular “on-the-go” meals in the country. Therefore, not only did the prescribed food benefit his medical condition but it also incurred no extra cost, in contrast to many medically prescribed foods.

The patient’s surprise that the dietary prescription had led to the completion of his treatment encouraged him to ask more questions and a discussion with the student about how to better control his systemic disease. Conversely, the student applied their knowledge and was exposed to an excellent example of integrated management that included both treatment and behavior modification.

Conclusions

This case provided an opportunity to emphasize quality patient care by integrating disciplines related to both prevention and treatment. It also allowed the dentist to play an active role in the medical management of the patient with the physician. Dietary guidelines for systemically ill patients undergoing specific dental treatments would be highly desirable to help expedite their recovery.

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