Management of a Diabetic Patient with Philosophical Mental Attitude: A Case Report

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Abstract

Diabetes Mellitus is a metabolic disorder. It has been recognized as a pandemic and is a nutritional disorder. It affects almost every organ system in the human body, including the patient's psychology. It occurs due to irregularity in the insulin secretion. The most characteristic feature is hyperglycemia. The underlying factors, contributing to this disease are age,genetics, obesity, lack of physical activity, etc. A prosthodontist should have a thorough understanding of the general considerations for diabetes mellitus patients as well as the prosthodontic consideration. This article reviews the prosthodontic management of a patient with diabetes mellitus, supported by a case report of a complete denture patient with a philosophical mental attitude.

Keywords: *Diabetes, Clinical features, Prosthodontic management, Dental.*

Introduction

Diabetes mellitus is a metabolic disorder. The abnormality in insulin secretion affects the carbohydrates, lipids, and protein metabolism. The most important basis of diagnosis is hyperglycemia. This is a chronic condition that may have other neurological, cardiovascular, cerebrovascular, nephrological, ophthalmologic disorders associated. The understanding of systemic effects of diabetes mellitus, its effects on the oral tissues, patient psychology and other complications associated with long-standing disease is essential to treat a diabetes mellitus patient, reporting in the dental office.[1,2] The onset of diabetes mellitus Type -2 is usually after 40 years of age and its prevalence increases with age. This is related to genetics, obesity and also lack of physical activity and not to the destruction of Island cells of Pancreas.[3,4,5]

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Polyuria, Polydipsia and Polyphagia are the main symptoms for diagnosis.[6]

World Health Organization has predicted that by 2025, there will be a rise in prevalence of 300 million from 135 million cases, which is alarming .[7] American Diabetic Association recommends that the screening for Fasting blood sugar should be done for overweight individuals, no matter age, if Body Mass Index is more than 25 and every 3 years from 45 years of age, if the subject is obese.[8,9] The earlier the diagnosis is made, the better it is for the patient. The issue is patients report only after they have symptoms like polyphagia, polydipsia and polyphagia.[10]

Oral Manifestations:

The diabetic patients have the following oral manifestations:[8]

- Burning sensation of the mouth/mucosa
- Inflammation of gingiva and periodontitis
- Increased risk of caries
- Resorption of alveolar bone
- Delayed wound healing
- Opportunistic infections like fungal infections
- Xerostomia

The tolerance to removable prosthesis, like complete denture is also less.[11]

All the above oral manifestations occur due to:[8,12]

- Micro-vascular changes
- Increased concentration of glucose in saliva
- Impaired host-resistance which is a result of the defective function of Polymorphonuclear Neutrophils

Prosthodontic Considerations:

A few general dental considerations to be followed by the prosthodontist:[13]

- Proper history-taking of general health conditions and verification of blood reports
- A consultation with the patient's physician regarding his medications and dental procedure planned is beneficial.
- Radiological investigations should be done for all cases.
- Oral hygiene should be good, before starting any procedure. The patient should be advised to use anti-bacterial mouth-washes and gels.
- The procedures causing minimal trauma and that are minimally invasive should be carried out
- The procedures should be in a stress-free environment as possible
- Appointments should be of short duration
- If there is a chance of any pain due to invasive procedures, prophylactic medication is mandatory.
- Medication and dietary counseling is a must for every case.
- Hypoglycemic shock should be managed properly with proper monitoring of vital signs, depending on the severity. Nausea, perspiration, hunger, palor and tachycardia are indicative of it.

Following are the Prosthodontic Considerations:

- As mentioned earlier, general health history taking should be followed by dental history taking, assessment of the findings and thorough examination.
- Oral hygiene status should be evaluated before beginning any prosthetic procedure. The patient should be counseled for the maintenance of good oral hygiene and its importance.
- History of edentulism, cause of loss of teeth, type of prosthesis, etc should be noted.
- The number of appointments and duration of treatment should be planned and informed to the patient.[13]
- Recent reports of visits to the treating physician, along with laboratory investigation reports should be presented in the clinic. This should be brought to the clinic in every sitting.
- The blood sugar level should be checked with a glucometer, before starting the procedure, in every sitting.[14]
- Oral hygiene procedures like scaling and root-planing should precede removable partial denture therapy.
- The design of RPD should be appropriate, to make the prosthesis tissue-friendly.
- The prosthesis should be self-cleansing and should have point contact between natural abutments and prosthesis
- The occlusion should be freely gliding in all prostheses, thus the scheme should be carefully selected.
- In case of complete denture, the techniques that would retard resorption of bone should be followed. They are: mucositis impression technique; use of tissue-friendly material; verification of Vertical Dimension at occlusion; use of neutral zone concept wherever required
- Regular follow-ups are mandatory
- For Fixed Partial Denture prostheses: Supra-gingival margin with chamfer finish-line on the facial surface is preferable as it reduces stress-concentration; Crown-root ratio should never be compromised; Ante's Law should be mandatory; 3/4th crowns may be advisable in premolars;Periodontal therapy, Crown-lengthening, orthodontic extrusions may improve the prognosis of the treatment.
- Implant treatment should be planned only when the blood sugar levels are within permissible limits. Besides, the above points should also be considered .[9] Complete history taking, radiographic evaluation, implant site selection, abutment selection, prosthesis selection and scheme of occlusion determine the success of implant therapy . [15]

- The mental attitude and impact of the treatment on the psychology of the patient should also be tactfully evaluated in all the cases.[16]

Case-Discussion:

A 78-year-old man reported to the Department of Prosthodontics and Crown & Bridge, Institute of Dental Sciences with the chief complaint of difficulty in chewing and wanted a new pair of dentures. The detailed case-history was taken which gave the following findings: Patient was diabetic for more than 20 years and was under regular medications; blood sugar levels were remaining under control, according to last 3 years reports; the patient had taken prior permission from his endocrinologist for the treatment; all the teeth were missing; the patient was an old denture wearer; denture was fabricated elsewhere 4 years back and no follow-ups were done; on examination, it was found that the oral mucosa was in good condition, which suggests of maintenance of oral hygiene **[Figure 1]**. There were retention and stability issues in the old denture and the patient insisted on a new set of dentures. There was no history of any habits. The patient was under the regular supervision of a dietitian. He was aware of his meal timings and followed the dietitian's instructions. The treatment was planned with seven short, morning appointments, between 9:30 AM to 10:30 AM. The patient was explained about the procedure and also counseled regarding the importance of follow-up procedures. He had reasonable questions regarding the treatment which were satisfactorily answered, which indicated that he understood the treatment. He was very calm, willing to commit to the treatment and follow the instruction.

Figure 1: Intra-oral pictures of the edentulous arches

First Appointment: The perforated stock trays were selected. Impressions were made using alginate (Zhermack, Tropicalgin). The patient was recalled for the second appointment. The primary cast was poured using Type II gypsum (B.N. Stone Dental Plaster)in the laboratory. The markings for the spacer extensions and special tray extensions were done. The full wax spacer was designed.

Figure 2: Final impressions of the edentulous arches after the border molding

Second Appointment: Border-molding was done using the sectional method. The final-impressions were made with Zinc-Oxide Eugenol Impression Paste (DPI) [Figure 2]. This appointment was of the longest duration, i.e, 1 hour. The patient was given a break for 10 minutes after 30 minutes. The impressions were beaded and boxed in the laboratory. The master cast was poured using Type III gypsum (B.N. Stone Dental stone).

Third appointment: Adjustments on the temporary record bases with occlusal rims were done. Silvermann's closest speaking space was measured and Niswonger's method was used to record the vertical jaw relation **[Figure 3]**. Teeth set was selected in the clinic (Acryrock Teeth set). The pressure-less method was used to record the horizontal jaw relation. The related and sealed rims were transferred to the master casts. Articulation was done in a 3-point mean-value articulator. Anterior teeth arrangement was done.

Figure 3: Markings for jaw-relation

Fourth and fifth appointment: Trial of anterior teeth arrangement was done. The patient was recalled for the fifth appointment, immediately the next day. The posterior teeth arrangement was completed and the trial was done with necessary modifications. **[Figure 3]**. In the laboratory, carving and wax-up was completed. The dentures were processed, cured, and finished for the insertion step. The finished denture was remounted and corrections were done before the final appointment.

Figure 4: Wax trial

Sixth and seventh appointment: The finished denture was inserted **[Figure 4]** and all the necessary verifications were made. The occlusion was modified. The patient was instructed to use the denture for 24 hours and report for a follow-up the next day. Other post-insertion instructions were given. The oral mucosa was examined thoroughly for pressure sores. Modification to remove pressure points on the tissue surface of dentures were made. Final polishing of the dentures was done and dentures were re-inserted. The patient was asked for reviews and was also made to understand to report after a week and then after a month.

Figure 5: Intra-oral pictures after denture insertion

The patient had reported for the one week and one-month follow-ups. During the treatment, the patient would give his input regarding the steps. Every instruction was sincerely followed by the patient. He never reported with any attendant who speak for him, suggestive of his independent mind.

Conclusion

The prognosis of the treatment was good because the patient's mental attitude was the most important determinant. He maintained himself well, despite his long history of Diabetes mellitus, understood his needs and was committed to being treated. The patient's philosophical mindset benefitted him for a positive treatment outcome.[16] Diabetes mellitus is a complex disease and requires a multi-disciplinary approach in the treatment. Patient's motivation for treatment increases the chances of a better prognosis. The goals of prosthodontic therapy are also reached with proper treatment, counseling by the clinician, and a patient's positive approach towards treatment.

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References

1. Varon F, Shipman M. The role of dental professional in diabetes care. J Contemp Dent Prac 2000; 1:1-27.
2. Kansal G, Goyal D. Prosthodontic Management of Patients With Diabetes Mellitus. J Adv Med Dent Scie Res 2013;1(1):38-44.
3. Cristina de Lima D, Cristina Nakata G, Balducci I, Dias Almeida J. Oral manifestations of diabetes mellitus in complete denture wearers. British Dental Journal. 2008;204(9):513-513.
4. Morrato EH, Hill JO, Wyatt HR, Ghushchyan V, Sullivan PW. Physical activity in U.S. adults with diabetes and at risk for developing diabetes, 2003. Diabetes Care 2007;30:203-9.
5. Owen KR, McCarthy MI. Genetics of type 2 diabetes. Curr Opin Genet Dev 2007;17:239-44.
6. Soysa NS, Samaranayabe LP, Ellepole AN. Diabetes Mellitus as a contributory factor in oral candidosis. Diabet Med 2006; 23:455-9.
7. Fiske J. Diabetes Mellitus and Oral Care. Dent Update 2004; 31: 190-8.
8. Natasha Stavreva. "Considerations of Oral Manifestations and Prosthodontic Management of Patients with Diabetes Mellitus." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 8, 2019, pp 21-23.
9. Vernillo AT. Diabetes Mellitus: Relevance dental treatment. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2001; 91:263-70.
10. Basit A, Hydrie MZI, Ahmed K, Hakeem R. Prevalence of diabetes, impaired fasting glucose and associated risk factors in a rural area of Balochistan province acoording to new ADA criteria. J Pak Med Assoc 2002; 52: 357-360.
11. Soell M, Hassan M, Miliauskaite A, Haikel Y, Selimovick D The oral cavity of elderly patients in diabetes. Diabetes Metab 2007; 33 Suppl 1: 10-18.
12. Lima DC, Nakata GC, Balducci I, Almeida JI. Oral manifestations of Diabetes Mellitus in complete denture wearers. J Prosthet Dent 2008; 99: 60-65.
13. Miley DD, Terezhalmy GT. The patients with Diabetes Mellitus: Etiology, epidemiology, principles of medical management, oral disease burden and principles of dental management. Quintessance Int 2005; 36: 779-795
14. Habib SS, Almas K. Management of Diabetic patients in dental practice. J Pak Dent Assoc, 2002, 11, 101-106.
15. Roumanas FD, Garrett NR, Hamada MO, Diener RM, Kapur KK. A randomized clinical trial comparing the efficacy of mandibular implant-supported overdentures and conventional dentures in Diabetic patients. Part V: Food preference comparisons. J Prosthet Dent 2002; 87:62-73.
16. Seifert I, Langer A, Michmann J. Evaluation of psychologic factors in geriatric denture patients. J Prosthet Dent 1962;12:516-23.