CASE REPORT

Holistic Approach of Periodontitis Patient with Diabetes Mellitus: A Case Report

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ABSTRACT

Diabetes mellitus (DM) is a common risk factor for patients with periodontal disease. Periodontitis patients with poor glycaemic control present with severe and advanced periodontal tissue destruction. A multidisciplinary approach between the periodontist and medical practitioner is clinically proven to maintain the patient's periodontal health and general well-being. This case report aims to raise the awareness and provide a basic guideline for medical and dental practitioners in identifying and managing periodontitis patients with undiagnosed DM particularly if patient is presented with recurrent periodontal abscess. A 34-year-old Malay lady presented with recurrent periodontal abscess and diagnosed with Periodontitis Stage III Grade C was treated holistically by the periodontist and a medical practitioner. The patient's compliance towards the periodontal treatment, routine medical check-ups, and medications has helped the patient achieved better periodontal health and controlled glycaemic level. Following her sixth periodontal re-evaluation in two years improvement in oral hygiene, resolution of gingival swelling and bleeding were seen after sequences of non-surgical, surgical periodontal treatment and patient's compliance towards her medications and follow-up.

Keywords
periodontitis, diabetes mellitus, periodontal health, glycaemic control, compliance

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Received: 22nd July 2021; Accepted: 19th January 2022

Doi: https://doi.org/10.31436/imjm.v22i2

INTRODUCTION

Periodontitis is an irreversible inflammation of the gum marked by the destruction of tooth-supporting structure and may lead to tooth loss. Several factors determine the severity of periodontitis. These include the severity of periodontal attachment loss, complexity of the treatment needed, and the extent of the periodontitis, either localised or generalised.[1] In diabetes mellitus (DM) patients, the risk of having periodontitis is two to three times greater than in healthy individuals. Severe periodontitis has been reported in type 2 DM patients with progressive bone and periodontal attachment loss among those diagnosed with diabetic nephropathy.[2]

Periodontal abscess is another important clinical sign and indicator for undiagnosed DM in periodontitis patient.[3] The presence of one of these conditions may lead to the diagnosis of the other. Unfortunately, currently, the prevalence of undiagnosed DM among periodontitis patients are still high.[4] Therefore, the aim of this case report is to raise the awareness and provide a basic guideline for general practitioners in identifying and managing periodontitis patients with undiagnosed DM.

CASE REPORT

A 34-year-old Malay lady came to our clinic with a complaint of multiple episodes of gingival swelling and frequent bleeding while brushing the teeth with no pus discharge. The swelling, however, was painless and did not disturb her sleep. This was her second episode of gingival swelling, and it started about a few weeks earlier. She had a history of gestational diabetes mellitus (GDM) during her second and third pregnancies with insulin injection.

She claimed that she was free from DM as her blood glucose level was normal during every six-monthly visit to the medical practitioner. In addition, she had a strong DM family history. During oral examination, the periodontal abscesses were noted on the buccal side of the upper right and left first molars. Despite having adequate plaque

control, her gingiva was generally inflamed with the periodontal pocket depths (PPD) ranging from 5 to 10mm. Grade II furcation involvement was noted on the upper right first molar, and the tooth was mobile with grade 3 mobility. Baseline periodontal examination inclusive of intraoral clinical photograph (Figure 1) and full mouth periodontal charting (Figure 2) taken at baseline are shown below.

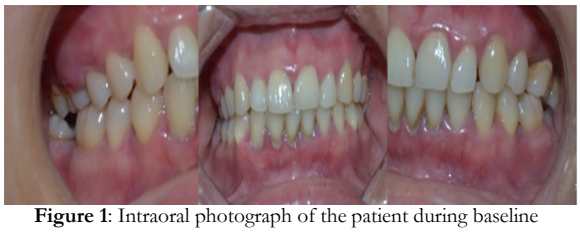

Figure 1: Intraoral photograph of the patient during baseline

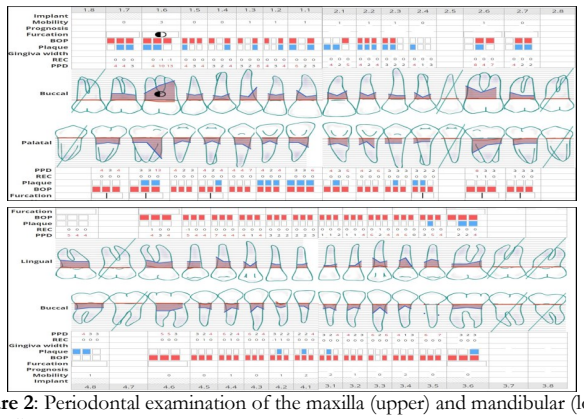

Figure 2: Periodontal examination of the maxilla (upper) and mandibular (lower) at baseline

Dental panoramic radiograph examination (Figure 3) at baseline showed general horizontal alveolar bone loss at 1/3 of the root length on the maxilla and mandibular. In addition, more than 1/3 of root length wide vertical bone loss was noted on the mesial aspect of upper left first molar.

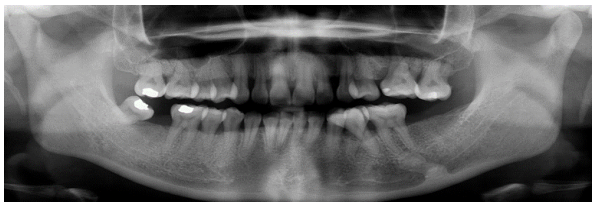

Figure 3: Dental panoramic radiograph examination of the patient at baseline

Intraoral periapical radiograph (IOPA) of upper right and left first molars were taken to aid in the radiographic findings. Based on Figure 4 below, more than one third of root length vertical bone loss with source of infection originated from the mesial root of upper right first molar was seen with guttae percha tracking. Meanwhile, more than one third of root length vertical bone loss was noted on mesial and distal of upper left first molar was seen. Hence, based on the full-mouth periodontal examination, the patient was diagnosed with Generalised Periodontitis Stage III Grade C.[1]

Figure 4: Intraoral periapical radiograph of upper right (left) and left (right) first molars

As one of the initial management, the patient was advised and referred to a medical practitioner due to her history of GDM, strong family history with DM, increased random blood sugar (RBS) level 2 hours postprandial (11.4mmol/L) and recurrent periodontal abscesses of the upper right and left molars. Patient was then consulted by the medical practitioner for diet control without prescription of any medication. After two months of non-surgical periodontal therapy, the patient claimed an improvement in her gingival condition with no episode of gingival bleeding during toothbrushing. However, the patient still developed gingival swelling on the upper left first molar with pus, and her RBS was 21.8mmol/L 2 hours postprandial. In addition, the patient also complained of polyuria, polyphagia, and polydipsia when further questions being asked.

Figure 5: Intraoral clinical photograph of the patient after periodontal therapy

Deep scaling to drain out the pus that caused the gingival swelling at the upper left molar was performed under local anaesthesia. A letter of referral to general practitioner was given to follow up her DM condition. Subsequent her three monthly periodontal review visits, the patient informed that she has been diagnosed with type 2 diabetes mellitus (T2DM) and hypertension by the general medical practitioner. She is currently on Tab Gliclazide 160mg BD, Tab Perindopril 8mg OD, Tab Amlodipine 5mg OD and Tab Novastatin 10mg ON and her HbA1c level was 10.2%. Patient also presented with reduced periodontal

inflammation with reduction in PPD. Importantly, patient claimed that she did not develop gingival swelling anymore and felt more comfortable with her gingival condition.

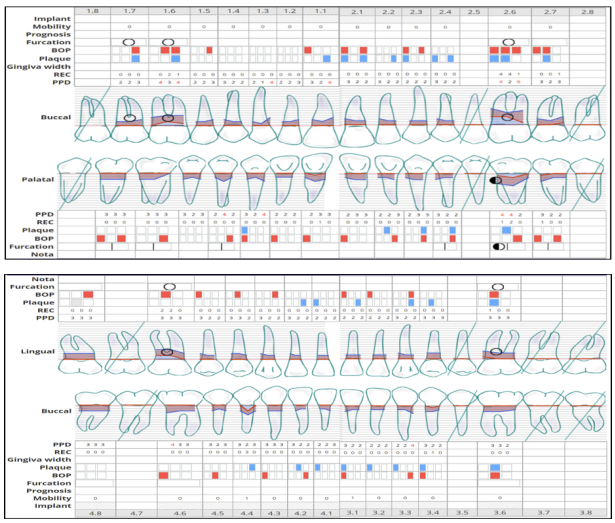

Figure 6: Periodontal examination of the maxilla (upper) and mandibular (lower) at sixth periodontal re-evaluation

DISCUSSION

The prevalence of undiagnosed DM in periodontitis patients are considerably high.[4] The lack of knowledge in identifying periodontal abscess as one of the important clinical presentations suggesting possibility of a patient having diabetes mellitus is often missed during routine dental check-up. As shown in the current case report, the patient was diagnosed with GDM during her second and third pregnancies but declared to be free from DM after she gave birth. She was unaware of her periodontal status before she attended the periodontal clinic.

Recurrent periodontal abscesses detected during periodontal examinations led to the identification and diagnosis of undiagnosed diabetes mellitus in periodontitis patient with history of GDM. The current case report hence showed the strong relationship between GDM and periodontal disease as previously mentioned in a systematic review by Abariga and Whitcomb in 2016.[6] DM is highly associated with periodontal disease as poor glycaemic control will exacerbate the inflammation of the periodontal tissues that initiated by the dental biofilm. Poor-controlled diabetics tend to have defective polymorphonuclear leukocyte (PMNL) functions causing impairment in chemotaxis, phagocytosis and microbicidal function. Defective apoptosis of PMNL leads to an increase in retention of PMNL, causing more tissue destruction due to continuous release of matrix metalloproteinases (MMP) and reactive oxygen species (ROS) which usually presented with suppuration of the gingiva or in certain extend, periodontal abscess as presented in this case. Recurrent periodontal abscesses which did not commensurate with dental biofilm accumulation and increased RBS level of 21.8 mmol/L in patient of the current case report has raised the question for other signs and symptoms of diabetes mellitus including polyuria, polyphagia, and polydipsia. The common clinical signs and symptoms as well as recurrent periodontal abscess strengthened the referral to the medical practitioner for evaluation of patient's diabetic status.

Furthermore, healing is also impaired in diabetic patients with periodontal disease due to impaired fibroblast function, defective remodelling process and rapid degradation of newly synthesised collagen, and increased susceptibility to infection.[7–9] Thus, as presented in this case report, the periodontal abscess did not fully resolve despite completion of non-surgical periodontal therapy and improvement in plaque control before the patient was diagnosed and managed medically. In addition, periodontal inflammation contributes to the detrimental effect on the patient's glycaemic control. Periodontal inflammation, which acts as a source for pro-inflammatory cytokines (IL-6, TNF-α, and IL-1β), disrupts insulin signalling, which later led in reduction of glucose uptake by the cells.

Furthermore, continuous secretion of acute phase reactants (C-reactive protein, fibrinogen and plasminogen activator-I) contributes to insulin resistance. These two factors increase the risk for elevated blood glucose or glycated haemoglobin in diabetic patients with periodontal disease.[8,9] Another point that should be highlighted in this report is the role of the medical practitioners in recognising diabetic patient with periodontitis in Malaysia. Diabetic patients who complained of gingival swelling, bleeding gingiva and mobile teeth should always be referred to dental professionals, not only to improve the oral health quality of patients but also to reduce the inflammation that might be systemically involved. Recent clinical practise guideline (CPG) published by Ministry of

Health, Malaysia on managing diabetic patients has included the information on the relationship between periodontal disease and DM. Medical professionals have been recommended to investigate for any sign and symptoms of periodontal disease and immediate referral should be made for periodontal examination. Thus, a holistic approach through increasing the awareness, knowledge, attitude and practice on managing DM patients with periodontitis among the Malaysian primary medical professionals is in the best interest to improve the metabolic parameters and oral health.[10]

CONCLUSION

Recurrent periodontal abscess could be one of the signs for undiagnosed T2DM and strong multidisciplinary approach between both medical and dental practitioners in managing periodontal disease and DM has shown marked improvement in periodontitis patients with DM. Effective glycaemic control, thorough periodontal treatments in controlling the periodontal infections, and excellent patient's compliance to both treatments are the pre-requisite factors towards significant improvement in periodontal and medical status of a patient. Resolving periodontal infection helps to improve metabolic control and reduce the level of AGEs in diabetic patients with periodontal disease. Conversely, effective glycaemic control helps to reduce the periodontal disease complications.

ACKNOWLEDGEMENT

We thank the patient for her participation in this case report.

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