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Case Report

Comprehensive Management of a Patient with Drug Induced Gingival Overgrowth and Metabolic Syndrome

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ABSTRACT

Periodontitis and metabolic syndrome demonstrate a bidirectional relationship complicated by multiple risk factors. Gingival overgrowth (GO) is a manifestation of exaggerated inflammatory response of the gingivae in response to biofilm and varying local and systemic risk factors which include medications such as antihypertentive medication- nifedipine. A patient with multiple dental care needs with GO, complicated by systemic risk factors would invariably benefit from multidisciplinary approach for care.
A 57-year-old female was diagnosed with chronic periodontitis, nifedipine-induced GO and metabolic syndrome. Management encompassed initial nonsurgical periodontal therapy, where the patient was educated and guided towards better plaque control, following which, scaling, root debridement, and surgical therapy (gingivectomy and excisional new attachment procedure) were carried out. Along with periodontal therapy, she was also managed through restorative phase where a successful outcome was achieved. She was then followed-up with maintenance care, and nifedipine was substituted with captopril by the Physician to facilitate maintenance.

Keywords: Metabolic syndrome; Gingivectomy; Drug induced gingival overgrowth; Periodontitis; Excisional new attachment procedure

1 INTRODUCTION

Diseases of the periodontium affect one or all supporting tissues of the periodontium. Periodontal diseases (PDD) are considered to be the highest global oral health burden, afflicting a high percentage of the adult population [(1)]. Apart from the microbial aetiological factor, there are many contributory local and systemic risk factors that can influence the initiation and progression of PDD.

The primary aetiological factor of periodontal disease is well established as microbial plaque which is well organized into a complex biofilm. Nevertheless a number of host factors determine the pathogenesis and progression of the disease. As the disease is complicated by microbial factors, risk factors and other host-related factors, PDD is described as of multifactorial aetiology. Identification of risk factors of a patient is a vital component in the management of a patient, thus risk assessment should be performed at multiple levels [(2)].

Gingival overgrowth is a common phenomenon due to numerous local and systemic risk factors. Gingival overgrowth is commonly observed as a side effect of some medications, hormonal imbalances, ascorbic acid deficiency, leukemia or granulomatous diseases [(3)]. Obesity, high blood pressure, elevated plasma glucose and atherogenic dyslipidemia are conditions which may cluster in the same individual, and described as part of a condition termed metabolic syndrome (MS) [(4)]. Presence of three or more of the above conditions concurrently in an individual is considered as diagnostic criteria of MS which has been suggested as a major potential risk factor for progression of PDD [(5)].

For successful management of PDD, early diagnosis and careful treatment planning are essential aspects. Obtaining thorough history with special emphasis on medical and social history and identification of risk factors would be indispensable.

The following case describes management of a patient diagnosed with chronic periodontitis, drug induced gingival overgrowth and metabolic syndrome.

2 CASE REPORT

A 57-year-old female, presented with the chief complaint of bleeding gums from the anterior part of the mouth and protrusion of an upper right anterior tooth. She was a known diabetic with hypertension, and had no history of previous periodontal treatment. She was on oral hypoglycemic (Metformin) and antihypertensive (Nifedipine). She was from a low socio economic background, with no betel chewing or other parafunctional habits.

Her lips were slightly incompetent and maxillary right central incisor was protruding with one third of the tooth visible from the incisal edge extra-orally. Gingiva was oedematous, dark pink in colour with significant overgrowth in upper anterior palatal and lower anterior labial segments (Figures 1 and 2) All teeth were present with a retained root of maxillary left 3rd molar . Deep caries with pulp exposure were detected in maxillary right 1st molar and mandibular right 1st molar, while maxillary right 2nd molar had dentinal caries (Figure 3). Migration of maxillary right central incisor labially, lateral incisor distally were noted with anterior spacing of maxillary right central incisor, left central incisor ,left lateral incisor and left canine.

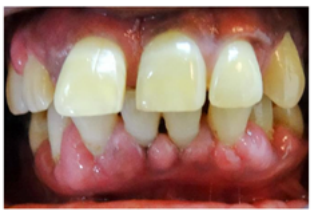

Fig. 1: Upper and lower teeth in occlusion (Pre operative)

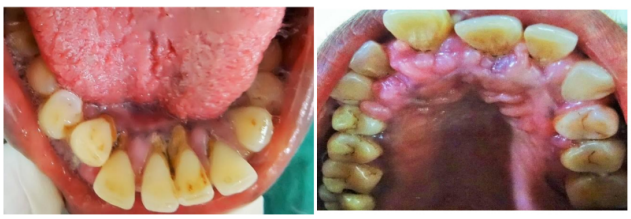

Fig. 2: Pre-operative intraoral view of lower anterior teeth and upper teeth

A Dental Panoramic Tomogram (DPT) and intra oral periapical radiographs (IOPA) revealed varying degrees of horizontal bone loss of upper and lower anterior teeth (Figure 4). Multiple radioopacities were visible at the apices of roots in the DPT which were suggestive of florid cement-osseous dysplasia or idiopathic osteosclerois.

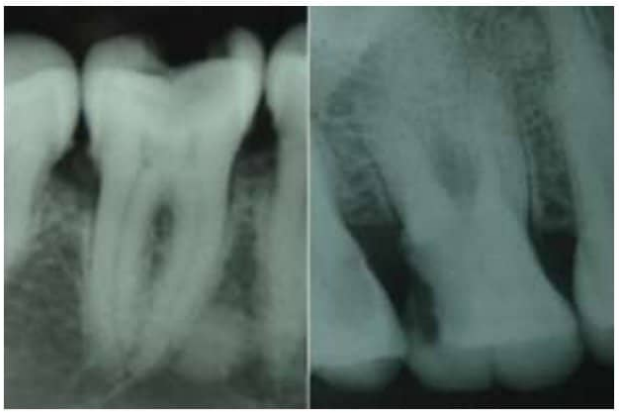

Fig. 3: Intraoral periapical radiographs of mandibular right 1st molar and maxillary right 1st molar

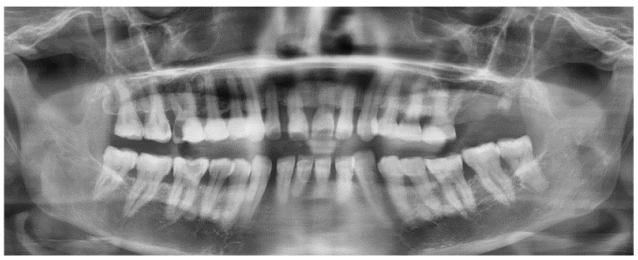

Fig. 4: Pre-operative dental panoramictomograph (DPT)

According to the findings, the diagnosis was made as "chronic localized mild to moderate periodontitis with nifidipine-induced gingival overgrowth in a 57-year-old female with metabolic syndrome".

A care plan was proposed to address the identified problems. The patient was first educated about existing diseases. The bidirectional relationship between periodontitis and diabetes mellitus as well as antihypertensive medication, nifedipine and gingival overgrowth was explained. Phase 1 with non surgical periodontal therapy (NSPT) included oral hygiene and plaque control instructions, scaling and root surface debridement (RSD) with hand and ultrasonic instruments. Endodontic treatment of maxillary right 1st molar and mandibular right 1st molar was carried out (Figure 5) while dentinal caries of maxillary right 2nd molar was restored with composite resin.

Following successful completion of phase 1 therapy (Figures 6 and 7), patient's medical status was reviewed at the 8 th week. Considering her satisfactory outcome of NSPT together with good glycemic (FBS 108mg/dl) and blood pressure (130mmHg/85mmHg) control, it was decided to proceed with phase 2 (surgical) therapy. The review period between phase 1 and 2 therapy was 10 weeks.

Gingivectomy was performed on palatal surfaces extending from maxillary right canine to left canine, labial and interdentally surfaces of mandibular right lateral incisor

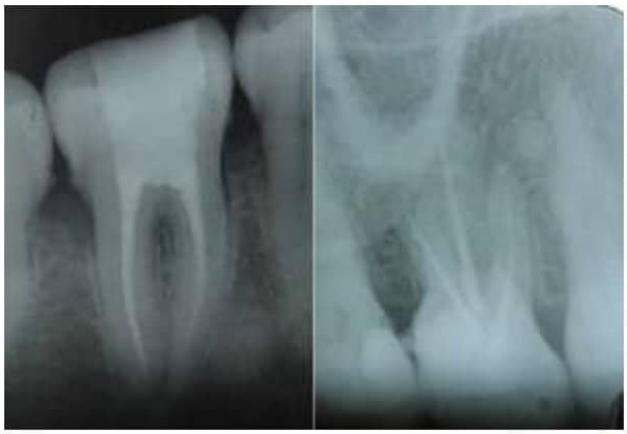

Fig. 5: Endodotically treated mandibular right 1st molar and maxillary right 1st molar

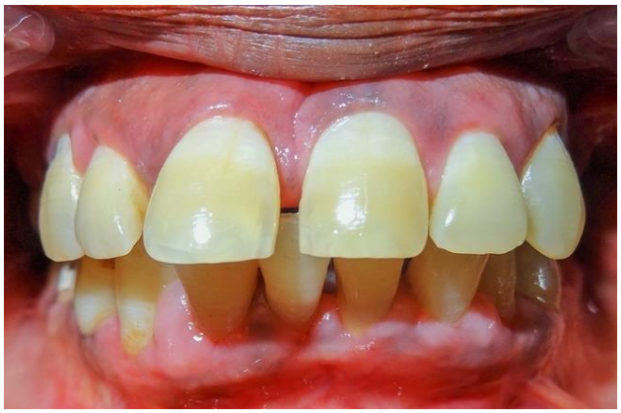

Fig. 6: Intraoral view of upper and lower teeth in occlusion (8 weeks following nonsurgical therapy)

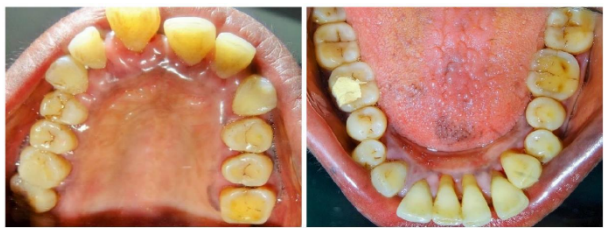

Fig. 7: Intraoral view of upper teeth and lower teeth (8 weeks following nonsurgical therapy)

and canine, maxillary right 1st and 2nd molar (Figure 8). Excisional New Attachment Procedure (ENAP)[6,7] was carried out in relation to the labial aspect of maxillary right canine to left canine (Figure 9). Surgical site was covered with a periodontal dressing (Coe-Pack) to promote healing and to reduce post-operative discomfort (Figure 10). Antibiotics and analgesics were prescribed to prevent post-operative infection and pain. Patient was recalled after 7 days from surgical treatment and healing was uneventful. Periodontal re-evaluation was carried out 3 months following the surgical phase. It revealed marked probing depth reductions (Annexure 1,2). Although her medical status was under control, medical advice was obtained from her physician since she was under nifedipine treatment for hypertension. Physician's recommendation was to alter nifedipine into captopril as a precautionary measure to overcome any recurrence of gingival overgrowth.

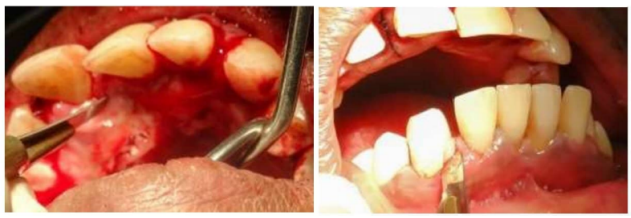

Fig. 8: Gingivectomy - maxillary anterior palatally, and mandibular right lateral incisor and canine labially

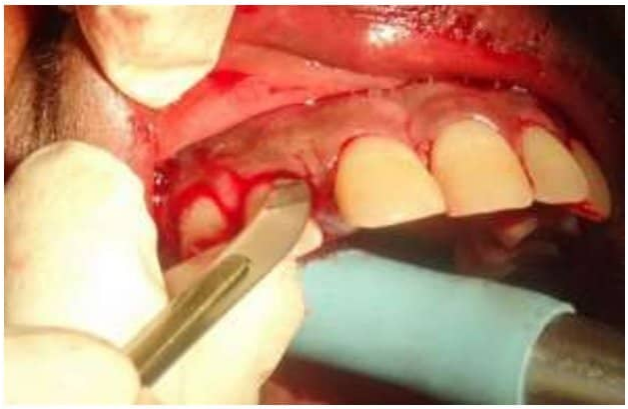

Fig. 9: ENAP surgery- maxillary right canine to left canine

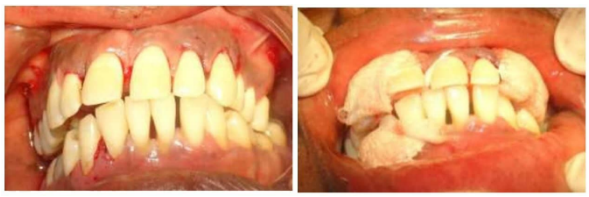

Fig. 10: Immediate post-surgical site (before and after placement of periodontal dressing)

Since the patient had satisfactory plaque control with significant improvement in periodontal status, phase 3 (restorative phase) was performed 3 months following the surgical phase. Metal onlay was constructed on endodontically treated maxillary right 1st molar as it was not in the aesthetic zone.

Although the available treatment options were explained to the patient for improvement of aesthetics of extruded and spaced maxillary right central incisor, she did not consent for lengthy, expensive orthodontic interventions. Therefore, composite resin restoration and recontouring of maxillary right central incisor with selective grinding of enamel at the incisal edge was carried out. Spaces between teeth (maxillary anteriors) were restored with composite resins (Figure 11). Patient was pleased with the final outcome of the treatment. Periodontal maintenance care was arranged with recall intervals varying from 6-12 weeks.

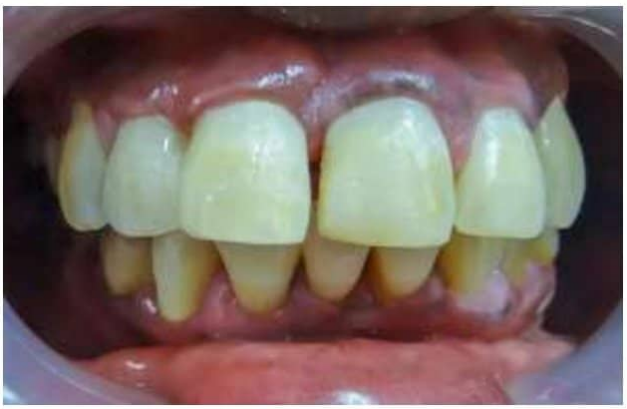

Fig. 11: Upper and lower teeth in occlusion (Post Operative)

3 DISCUSSION

Gingival enlargement is undue overgrowth of gingival tissue, histologically known as gingival hyperplasia (increase in cell number) or hypertrophy (increase in cell size)[3]. It can be either plaque-induced or non-plaque induced, although the commonest being plaque-induced inflammatory process modified by systemic factors including some medications. This patient was on antihypertensive, nifedipine which is known to contribute towards gingival overgrowth.

Drug induced gingival overgrowth (DIGO) may be a result of anticonvulsants, calcium channel blockers (CCB) and immunosuppressive medications. Cation influx of folic acid active transport within gingival fibroblast is reduced by all these drug categories which lead to change in matrix metalloproteinase metabolism and failure to activate collagenase. Degradation of accumulated connective tissue component is reduced in DIGO due to lack of available activated collagenases[8].These drugs induce glycosaminoglycans and collagen proliferation of gingival fibroblast, leading for accumulation of collagen in the cells[9].

Chronic periodontitis is a common disease of the oral cavity, and identification of causative factors including systemic risk factors was important in the management of this patient. Patient was regularly reviewed at the medical clinic by the physician. She was a known patient with uncontrolled diabetes and hypertention. Her waist circumference was > 35 inches (890mm) and considered as obese. Therefore, according to accepted diagnostic criteria of metabolic syndrome(MS), she had three features to be diagnosed as of MS[10,11].

Diabetes mellitus is a strong systemic risk factor for PDD, where susceptibility for periodontitis can be increased by three folds[12]. On the other hand, PDD is considered as the sixth complication of diabetes mellitus[1].

The primary aim of periodontal therapy is to preserve the dentition and prevent further loss of periodontal attachment. NSPT is of utmost importance in the initial periodontal management of a patient where elimination of aetiological and risk factors together with reduction of drug dose or switching to non-CCB antihypertensive and surgical excision if required provides satisfactory results[13,14]. In this patient, a successful outcome was achieved after completing both nonsurgical and surgical approaches of treatment together with changing antihypertensive medication to captopril.

4 CONCLUSION

Management of chronic periodontitis can be challenging when it coexists with numerous risk factors, both systemic and local. However, careful diagnosis and treatment planning are crucial aspects for a successful outcome. This case report highlights how a dental practitioner should carefully identify the medical risk factors in a patient and seek appropriate advice of the physician. Similarly the case highlights the systematic approach for both non-surgical and surgical methods of treatment adequately phased out with long term maintenance care.

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