

Management of Nifedipine-Induced Gingival Overgrowth with Drug Substitution: A case report

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Received: March 22, 2018; **Published:** April 27, 2018

Abstract

Nifedipine-induced gingival overgrowth (NIGO) is an abnormal growth of the gingival tissues in response to an adverse drug reaction in some patients treated for hypertension. The prevalence of gingival overgrowth associated with calcium channel blockers has been reported to be 15 - 85% with an average composite of around 42%, in patients taking nifedipine.

Aim: The aim is to present a non-surgical management for NIGO, with medication substitution.

Material and Methods: a forty-one-year-old lady, showed up at periodontics clinic complaining of gingival tissue overgrowth. She has a history of blood hypertension and she has been treated for four years with Adalat CC 60 mg and Concor 10 mg daily. After comprehensive examination, she was diagnosed with NIGO. The patient was referred to her physician, and Adalat was replaced with Diovan 80 mg and Natrilix SR 1.5 mg once daily. Periodontal management included scaling and root planing. Patient was instructed for meticulous plaque control measures and recalled every three months for maintenance.

Results: The tissue responded excellent to non-surgical treatment with quite tissue shrinkage.

Conclusion: The most effective treatment for patients with gingival enlargement is the possibility of withdrawal of the medication and substitution with others. In some cases, this substitution is not possible.

Keywords: Calcium Channel Blockers; Gingival Overgrowth; Medication Substitution; Nifedipine

Abbreviation

NIGO: Nifedipine-Induced Gingival Overgrowth

Introduction

Patients using medications have been increasing in numbers at dental clinics. Some of these medications have side effects to the oral cavity and periodontal tissues. One of the pharmacologic unwanted side effects of these medications is gingival overgrowth [1]. Several factors namely; age, genetic predisposition, presence of preexisting plaque, immunological changes, pharmacokinetic variables and gingival inflammation influence the relationship between the medications and gingival tissue [2]. Gingival enlargement may create speech, mastication and esthetic problems [3]. However, not all patients taking these drugs develop drug-induced gingival overgrowth. The incidence of gingival overgrowth can be 50% in epileptics, 30% in transplant patients, and 20% in hypertension subjects treated with calcium-channel blocking agents [4].

Nifedipine, sold under the brand names: Adalat, Procardia and others. It is a calcium-channel blocking agent and dihydropyridine derivative. Nifedipine is a medication used to manage angina, high blood pressure, Raynaud's phenomenon, premature labor and Prinzmetal angina [5]. It was discovered in 1969 and approved for use in the United States in 1981. It is on the World Health Organization's List of essential medicines, the most effective and safe medicine needed in a health system [6].

The prevalence of gingival overgrowth associated with calcium channel blockers has been reported to be 15 - 85% with an average composite of around 42%, in patients taking nifedipine (Adalat, Procardia). However, the prevalence with other calcium channel blockers, such as Varapamil, Dilatiazem, Felodipine, or Amlodipine, is significantly less and reported to be around 5% [7].

Although there are previous reports of nifedipine-induced gingival enlargement that managed with non-surgical therapy, there are no comprehensive description of cases managed effectively with drug substitution. Therefore, the aim of this case report is to present a careful management of nifedipine-induced gingival overgrowth with medication substitute and periodontal treatment including surgical and non-surgical management.

Case Report

A forty-two-year-old lady showed up in the periodontal clinic at Dental College of King Saud University, complaining of gingival overgrowth and bleeding gums during brushing in the mandibular and maxillary regions. The swelling is progressively increasing causing difficulty in mastication and oral hygiene. Past medical history revealed a history of hypertension for the last four years, for which she was receiving Adalat CC 60 mg and Concor 10 mg daily. There is a family history of blood hypertension in her father and mother.

Patient noticed gradual increase in the size of gingiva at maxillary right region after a year of anti-hypertension medications administration. Later, the enlargement spread gradually to other teeth causing esthetic disfigurement.

On examination, generalized gingival enlargement was noticed in the upper and lower arches, with an isolated nodular growth observed in the right side of the upper arch. Generally, the enlarged gingiva was firm, pale pink and resilient with a minutely lobulated surface. However, there were few red spotted areas scattered in the upper arch. The gingiva showed a tendency to bleed (Figures 1A, B, C, D and E). There were accumulations of plaque at the gingival margins and deposits of calculus subgingivally. The pockets depth ranged from 3 to 4 mm. Upon radiographic examination, there was a generalized 30% horizontal bone loss with localized vertical defects in teeth # 16 mesially and # 47 mesially (Figure 2). A remaining root was noticed at # 15 area.



Figure 1: Initial Intra-Oral Photos Showing the Gingival Overgrowth. A) Frontal View. B) Right Side View. C) Left Side View. D) Upper Occlusal View. E) Lower Occlusal View.



Figure 2: Panoramic view x-ray.

Based on the clinical presentation of the gingival enlargement and a history of nifedipine intake, the case was diagnosed as Nifedipine-induced gingival overgrowth. The plaque is the primary risk factor and calculus is a secondary risk factor.

The patient was referred to her physician for nifedipine substitute to other anti-hypertension medications. Then, an emergency gingivectomy was performed around tooth # 16 because the gingival over-growth there was interfering with occlusion. Also, the remaining root was extracted. The nifedipine (Adalat CC 60 mg) was replaced with Diovan 80 mg once daily. Diovan (valsartan) is an angiotensin II receptor antagonist. Diovan keeps blood vessels from narrowing, which lowers blood pressure and improves blood flow. Natrilix SR 1.5 mg (indapamide) was added later to improve the control over blood pressure. Natrilix SR is a thiazide diuretic. It lowers blood pressure and fluid retention in edema by removing the extra water and certain electrolytes from the body.

Periodontal management consisted of supra and subgingival scaling and root planning, followed by careful instructions on oral hygiene procedures. The case was reviewed for any signs of improvement after a period of two months. The tissue responded excellent to nonsurgical treatment and medication replacement with quite volume shrinkage. The blood pressure was 134/79. Gingiva looked healthy regarding its colour, shape and texture except the upper right area which displayed slight gingival irregularities (Figures 3A, B). A gingivoplasty was performed using gingival knife to the upper right area to reshape the gingival tissues irregularities. The patient was reinforced on oral hygiene instructions Chlorhexidine mouth rinse 0.2% twice daily for 15 days, followed every three months with hygienist. After seven months, the gingival tissue was well maintained, and the patient did not show any recurrence of enlargement (Figures 4A, B, C, D, and E). Patient is on Diovan 80 mg, Natrilix SR 1.5 mg, Concor 10 mg and Lipitor 10 mg, and the blood pressure is now 135/83.

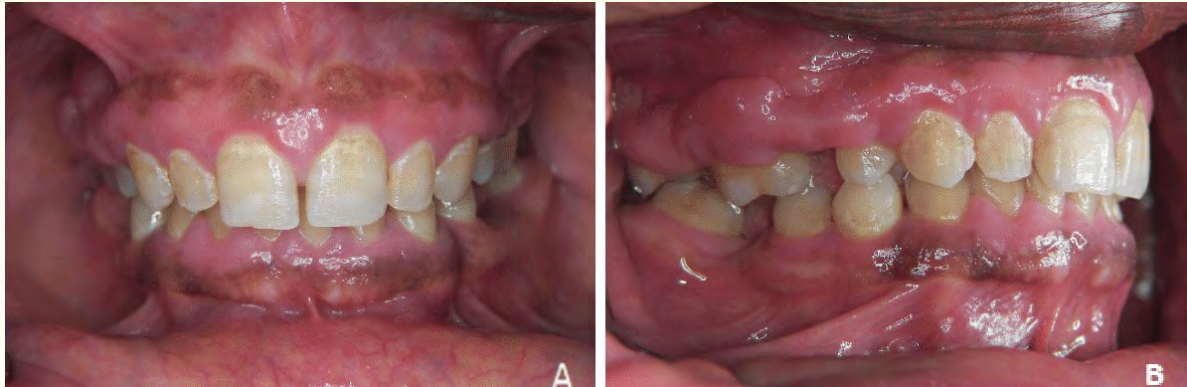


Figure 3: A) The Gingival Tissue Healing after two Months. B) Notice the Gingival Tissue Irregularities at the Upper Right Side



Figure 4: Follow-Up Photos After Seven Months. A) Frontal View. B) Right Side View. C) Left Side View. D) Upper Occlusal View. E) Lower Occlusal View.

Discussion

The pathogenesis of drug-induced gingival overgrowths is not completely understood. It has been hypothesized that the mechanism through which these medications trigger the connective tissue response could be an abnormal susceptibility of fibroblasts to these medications [4]. When an interaction occurred between nifedipine and gingival fibroblasts, overproduction of collagen and extracellular ground substance occurs and leads to increase in the gingival size. The drug interferes with the calcium metabolism of fibroblast cells and hence reduces the production of the degrading enzyme collagenase [4].

According to the Academy of Periodontology report, the patient's oral hygiene represents a significant risk factor for drug-induced gingival overgrowth. Plaque-induced inflammation can exacerbate the effect of medications, leading to a combined effect on the gingival tissues. Some investigators believe that inflammation is a prerequisite for gingival overgrowth that could be prevented by proper plaque removal [3,4]. This is supported by the fact that edentulous areas did not show signs of enlargement in most reported cases. In the present case, the gingival overgrowth has improved much after periodontal therapy and plaque removal. With gingival tissue shrinkage, the patient was able to perform her oral hygiene properly.

The daily dose, blood level, salivary levels, and gingival crevicular levels of the drugs have been related to the presence of gingival overgrowth. This effect is dose-related, with minimum baseline and threshold level required to induce gingival changes. In the case of calcium channel blockers, Ellis, *et al.* [7] assayed nifedipine levels in the plasma and gingival crevicular fluid and found that patients with high drug concentration in the crevicular fluid developed gingival enlargement, in contrast to patients where the drug could not be detected in the gingival crevicular fluid and the patients failed to develop gingival overgrowth [8].

There is little awareness about nifedipine-induced gingival overgrowth in medical field. There is a need to make a coordinated treatment plan between physicians and dentists for patients who are taking nifedipine, phenytoin and cyclosporine therapies.

Conclusion

The most effective treatment for patients with gingival enlargement caused by Nifedipine therapy is the possibility of withdrawal of the medication and substitution with others. In some cases, this substitution is not possible. Meticulous plaque control measures, combined with strict maintenance therapy, will be one of the essential methods of prevention and management of these cases.

Conflict of Interest

Author has none to declare.

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Volume 17 Issue 5 May 2018

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