Journal of Clinical and Biomedical Sciences

Case Report

An ounce of protection is worth a pound of cure: Periodontal management of Phenytoin Induced Gingival Enlargement.

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Abstract

Gingival enlargement (GE) is a condition of apprehension for both the patient and the doctor. GE can be due to inflammatory, idiopathic or drug induced. Drug induced gingival enlargement (DIGE) is an undesirable side effect resulting from intake of drugs like calcium channel blocker, immunosuppressant and anticonvulsants. Phenytoin an anticonvulsant drug has been associated with a characteristic oral presentation known as Phenytoin induced gingival enlargement (PIGE). Clinicians need to be aware of the possible side effects of Phenytoin and the treatment options available in order to minimize chances of gingival enlargement. The present case report shows the management of PIGE in a 25yr old female patient with Periodontal therapy by nonsurgical and surgical treatment approach.

Key Words: Gingival enlargement, Drug induced gingival enlargement, Phenytoin induced gingival enlargement.

Introduction

GE is the abnormal growth of the soft tissue covering the tooth or the alveolus which may be associated with variety of local (eg. poor oral hygiene, food impaction or mouth breathing) and systemic (eg. hormonal changes, drug therapy or tumour infiltrates) conditions. DIGE refers to the GE resulting from long term use of drugs such as antihypertensive calcium channel blockers such as nifedipine, verapamil, diltiazem; immune suppressant like cyclosporine and most common antiepileptic drug Phenytoin (PHT). Phenytoin sodium first introduced by Merritt & Putnam in the early 1938 is a commonly prescribed medication to treat partial seizures and generalized tonic-clonic seizures[1]. DIGE was first reported in 1939 by Kimball with chronic usage of antiepileptic drug PHT known as PIGE[2]. However the drug of choice worldwide to treat seizures is PHT. Etiological mechanisms suggested are an imbalance in collagen synthesis and degradation of gingival connective tissue, predominantly due to inhibition of collagen phagocytosis of gingival fibroblasts[3]. Uzel et al[4] demonstrated that connective growth factors were elevated which could be related to the more fibrotic presentation of the gingival tissue. Kato et al[5] suggest that PIGE is due to imbalance in collagen degradation rather than an increase in collagen synthesis. Other concurring factors that are attributed include increased dental plaque deposits, host genetic factors and reduced folate levels[6]. However the key pathogenesis behind the hyperplastic change in the gingiva still needs to be explored.

Around 30% to 50% of patients on PHT develop significant gingival alteration[7]. Upon withdrawal of phenytoin, gingival enlargement resolves spontaneously in approximately 1 to 6 months[8]. Some of anticonvulsants like phenobarbitone, vigabatrin and primidone have also been associated with GE but of lesser severity[9].

Although adequate literature is available as case reports and case series on PIGE there is a need for exposition on the management of these lesions that do not respond to withdrawal or substitution of drugs via periodontal therapy. The aim of this report is to present a case of PHT induced GE that was managed with periodontal therapy which comprises of nonsurgical and surgical treatment.

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Conflict of Interest: None
Financial Aid: Nil

Case Report

A 25yrs old female patient presented to the Department of Dentistry of R.L.Jalappa Hospital & Research centre affiliated to Sri Devaraj Urs Academy Higher Education and Research, Tamaka, Kolar, with

chief complaint of swelling with upper and lower gums region, gum bleeding and halitosis for the past 8 months. Patient gave a medical history of epilepsy, on treatment since 7yrs for which she was on Tab Eptoin 100 mg twice a day.

On intraoral examination showed generalized fibrous enlargement involving gingival tissue of upper and lower anterior. GE was up to the coronal 1/3rd of the teeth (Fig: 1). Her oral hygiene was poor with presence of subgingival calculus, presence of bleeding on probing and periodontal probing depth ranged from 2 to 6mm around most of the teeth. Clinical attachment loss was observed in tooth no. 11, 12, 21, 31, 41. Routine blood investigations were within normal limits and no other risk factors identified. A diagnosis of gingival enlargement associated with phenytoin was made. The patient's physician was consulted and as per advice drug was switched to Levipil 500mg twice daily along with vitamin C lozenges and folic acid supplements.

Periodontal treatment plan comprised of 2 phases, a nonsurgical and a surgical phase. In phase 1 full mouth supra and subgingival scaling along with root planning in regions of deep pocket were carried out. In phase 2, patient was reviewed after 2 weeks which revealed some reduction in inflammatory component of the gingiva (Fig: 2). Due to persistent GE 6months post drug substitution. Surgical gingivectomy was performed in the upper enlarged gingiva (Fig: 3&4) and 1week later the same procedure was repeated for lower gingiva (Fig: 5&6). All procedures carried out under local anaesthesia and antibiotic coverage. Patient was prescribed mouthwash chlorhexidine gluconate 0.12% post-surgery. Healing was satisfactory 1week post-operatively (Fig: 7). Patient was placed under regular maintenance protocol and had no signs of recurrence as on the 2nd year of follow-up (Fig: 8).

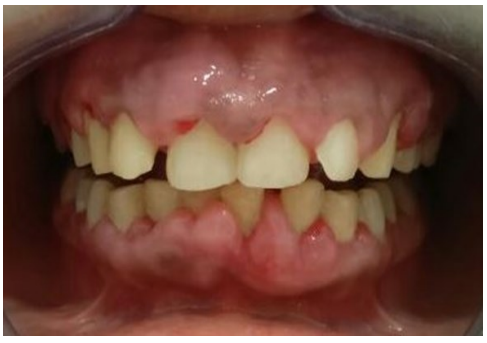

Figure 1: Preoperative view of GE

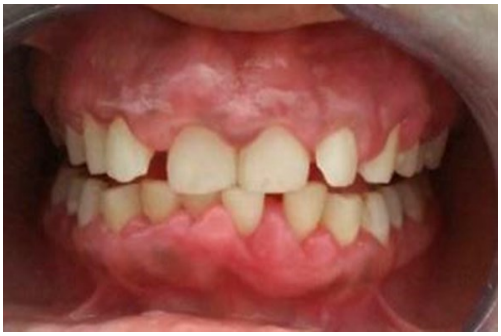

Figure 2: Post prophylaxis view of GE

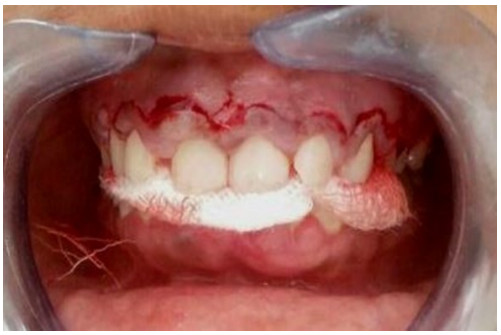

Figure 3: Internal bevel (Gingivectomy) incision of Upper arch

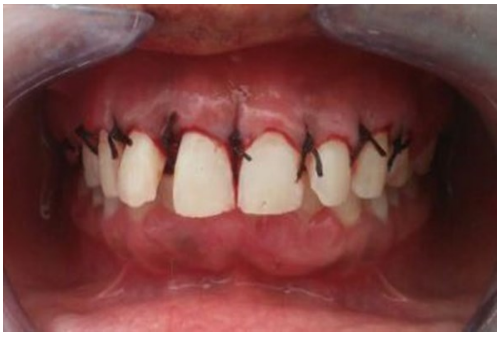

Figure 4: Postoperative Sutures placed in Upper arch

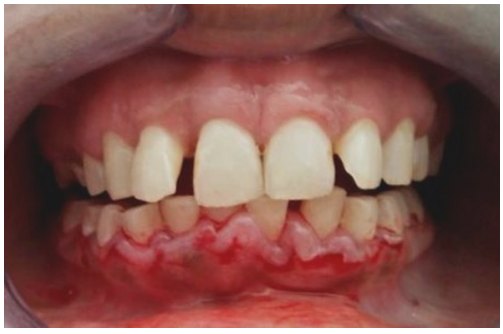

Figure 5: Internal bevel (Gingivectomy) incision of Lower arch

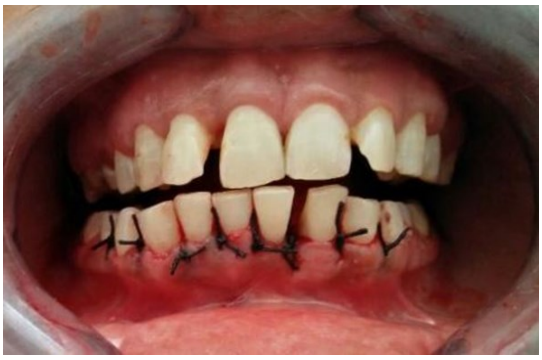

Figure 6 : Postoperative Sutures placed in Lower arch

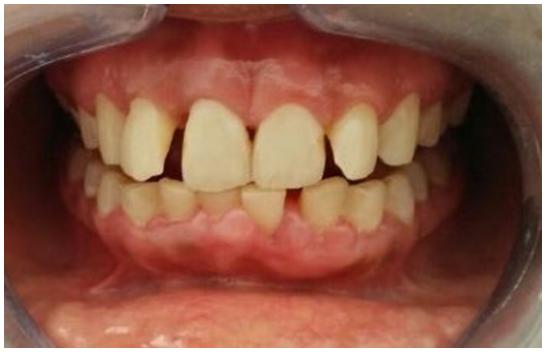

Figure 7 : 1 week Postoperative view of upper arch

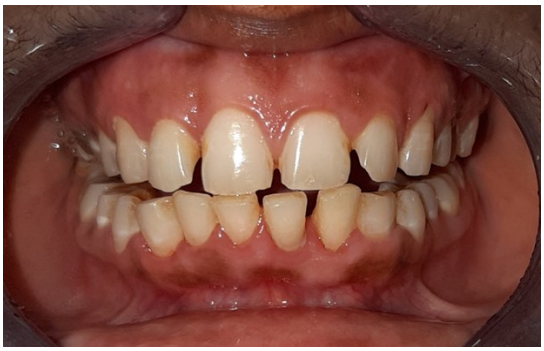

Figure 8 : 2yrs Follow-up

Discussion

The incidence of PIGE varies with different studies. It occurs more often in younger patients[7], which is in accordance to the present case. It is known to affect individuals who are susceptible and have a tendency to manifest within 1 to 3 months after consuming medication[7]. However in the present case GE was noticed 5years post PHT intake which could be attributed to folic acid deficiency as well as poor oral hygiene maintenance. It is a soft tissue growth which initially starts as a painless, bead-like, diffuse swelling at the region of interdental papilla which later on enlarges and combines to form a nodular swelling that progresses to the marginal gingiva subsequently to cover a huge portion of tooth structure[10]. It does not cause any form of tenderness unless secondarily infected.

Since the time PIGE was reported several studies have been conducted to evaluate their etio-pathogenesis. Correa et al[11] proposed that the mechanism of gingival overgrowth due to decreased collagen degradation may involve alteration in calcium metabolism, levels of matrix metalloproteinases and tissue inhibitor of metalloproteinases and integrin expression.

Studies by Kato et al[5] showed a reduction in the expression of gene encoding collagen type I and type III with higher density of these fibers in GE. And also a possible relationship between tumour necrosis factor – alpha production and PHT, as together they are known to cause impaired collagen metabolism as a consequence of enzymatic degradation of MMPs / TIMP – 1 possibly leading to collagen accumulation during GE. A recent study concluded that the CYP2C9 gene polymorphism is responsible for modification of inflammatory response to PHT[9].

Seymour et al[12], suggested that other risk factors like age, sex, drug variables, concomitant medication, periodontal variables and genetic factors may have an influence on PIGE.

Treatment of GE mainly aims to reduce inflammation and swelling of the gingiva in order to alleviate the discomfort, restore the masticatory ability and give a better aesthetic appearance to the patient. Modalities include

A. Withdrawal or substitution of PTH which takes 1 to 8 weeks for resolution and has been found to be the most effective treatment[13]. Carbamazepine, ethosuxmide and sodium valproate are alternate drug to PHT[14]. However in the present case Levetiracetam anticonvulsant drug was prescribed along with supplements like vitamin C and folic acid tablets which could have taken care of any folate deficiency in the patient. Contradicting data exists regarding recurrence rate of GE in patient receiving folate following surgical intervention[7]. If any drug substitution is attempted, it is important to allow for 6 - 12months elapsing between discontinuation of the offending drug and the possible resolution of gingival enlargement before a decision to implement surgical treatment is made[15].

B. Conservative nonsurgical approach: mainly reduces inflammatory component of the GE and thereby the need for surgery. An effective method followed is the Full mouth disinfection that includes Scaling and Root planning of entire dentition in 2 visits within 24hrs

which helps suppress all periodontal pathogens in short time not only from periodontal pocket but also from entire oropharyngeal region (mucous membrane, tongue, tonsil & saliva). Aena Jain P et al[16] study emphasises nonsurgical treatment option in treating GE.

C. Surgical intervention: patients with long standing GE where the swelling tends to persist irrespective of the substitution of drug and nonsurgical therapy than they are best managed with surgical intervention. Mavrogiannis et al[17] reported that PIGE could be managed by variety of techniques conventional gingivectomy, flap surgery and LASER excision however they concluded that scalpel gingivectomy as the treatment of choice. This standard method was followed in our patient with no signs of recurrence till the last review check-up.

The problem encountered with PIGE is that of high recurrence rate. Clinically, GE is almost exclusively related to dentate areas which suggest that factors such as dental plaque and gingival inflammation may be important in development of the condition. But meticulous oral hygiene maintenance, use of antibacterial mouth rinses and professional cleaning can reduce the inflammatory component of GE thereby the probability of recurrence[7].

Conclusion

Many hypotheses have been suggested regarding the pathogenesis of PIGE but exact cause is not completely understood, some of the evidences link to direct effect on genetically predetermined subpopulations of fibroblasts, inactivation of collagenase and plaque induce inflammation. For successful management of these cases appropriate treatment protocol needs to be planned i.e., by switching over to an alternate drug or nonsurgical/surgical interventions or combination of both. However importance of good oral hygiene cannot be ruled out in prevention of recurrence rates of GE.

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