Phenobarbitone induced gingival enlargement

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ABSTRACT:

Gingival enlargement or hyperplasia is one of the most undesirable consequences of few drugs like anti-convulsants, immunosuppressants and calcium channel blockers. This may often lead to severe aesthetic changes and compromised oral hygiene maintenance. Drug-induced gingival enlargement is also frequently associated with the presence of plaque, gingival inflammation and a genetic predisposition. This paper describes clinical features and management of gingival enlargement associated anti-epileptic therapy. Treatment generally employs stoppage of the drugs and then providing corrective surgery. Proper plaque control and effective oral hygiene can reduce its severity or prevent its occurrence.

Key words: Gingival enlargement, genetic predisposition, phenobarbitone.

Introduction:

Gingival overgrowth possess a serious concern to patients because of its cosmetically disfiguring and clinical symptoms including pain, tenderness, bleeding, speech disturbances, abnormal tooth movement, dental occlusion problems, enhancement of caries development and periodontal disorders.¹ Gingival enlargement is one of the most undesirable consequences of administration of some drugs like anti-convulsants, immunosuppressants and calcium channel blockers. Phenobarbitone generic is a barbiturate, prescribed for seizures, and treating sleep disorders. Phenobarbitone is also an anti-epileptic drug commonly used as a therapeutic agent in patients with epilepsy. Phenobarbitone is known to be the most common cause of gingival hyperplasia. Advantages of phenobarbitone include its effectiveness, low cost and frequency of administration.

They are used widely to treat conditions other than epilepsy, including migraine, neuropathic pain, anxiety, and bipolar disorder. Significant correlations between the occurrence and severity of this phenobarbitone-induced gingival enlargement and the presence of plaque and calculus accumulation have been demonstrated.² Some authors suggest that poor oral hygiene is an important risk factor for the expression of drug induced gingival overgrowth.³ Role of genetic factors in these gingival lesions also has been investigated. It has been suggested in the literature that human gingiva contains genetically predetermined phenobarbitone-sensitive subpopulations of fibroblasts; as a result, it reacts with some (but not all) cells, stimulating greater collagen and protein production.⁴

The clinical picture of phenobarbitone induced gingival enlargement shows the gingival tissues around the teeth inflamed and enlarged.

Case Report-

A 32 year old female patient came to the faculty of dental sciences; with a chief complaint of bleeding and swollen gums in lower anterior region of the jaw since 3 months. History revealed that the swelling started progressively and attained the present size since 3 months. Patient's medical history revealed that she was on anti-convulsant drug, i.e. phenobarbitone since 6 months. On clinical examination, the gingival tissues around the lower anterior teeth were inflamed and enlarged (Figure 1). Clinically, enlargement of the gingival tissues begins from interdental papillae, which gradually increases in size and extends laterally until adjacent papillae coalesce. Bleeding on probing was present and gingival lesion was inflammatory with reddish pink in colour. Mobility was absent and 5mm to 10mm probing depth present in relation to the teeth 33 to 43. IOPA-X ray of 43, 42, 41, 31, 32, 33 regions revealed horizontal bone loss in all the involved teeth and blood picture was within normal range.

Therefore, considering the dental history and radiographs, gingivectomy was planned with slight

gingivoplasty. The surgical technique was explained to the patient and informed consent was obtained. Preparation of the patient included scaling and root planing of the entire dentition; and oral hygiene instructions. After local anesthesia, pocket depths were measured and marked with a pocket marker. The thick, fibrous gingival tissue was excised with an external bevel incision from teeth 33 to 43, following a scalloped pattern around the gingival margin, with a 15 number blade. This was followed by a second incision, into the intracrevicular sulcus. The incision was extended distally 1 to 2 teeth to blend into the gingival sulcus of the untreated teeth. The third incision is then placed interproximally to release the interdental papilla. Additional minor gingival recontouring was performed to establish symmetrical gingival margins. After control of bleeding, periodontal dressing was placed on the operated site. Patient was given analgesics and antibiotics to control any post-operative infections. There was no post-operative complication and healing was satisfactory after 10 days (**Figure 2**). The patient was instructed to use soft tooth brush for mechanical plaque control in the surgical area. Patient was monitored on weekly schedule postoperatively, to ensure good oral hygiene in the surgerized area. Supportive periodontal maintenance at 3 months was prescribed to maintain periodontal health and to re-evaluate this area. At 12 months recall, there was successful healing with no recurrence and probing depth was minimal.

Discussion-

Epilepsy is the most common chronic neurological disorder in humans. Epilepsy treatment is based on drug-therapies which aim to help patients to achieve seizure freedom without adverse effects. Phenytoin is one of the most commonly prescribed medications to treat epilepsy and it may also be used in cases of neuralgias and cardiac arrhythmias.⁵ It is estimated that about 30 to 50% of patients taking phenytoin develop significant gingival alterations. The first report of gingival

Figure 1: Pre-operative clinical picture.

Figure 2: Post-operative clinical picture.

overgrowth associated with the chronic use of phenytoin was made in 1939.⁶

Because not all patients on phenytoin or phenobarbitone develop gingival overgrowth, identifying patients at risk is important in order to take necessary measures to minimize the onset and severity of this condition. Presently, the etiology of drug-induced gingival overgrowth is not clear but it is multifactorial. Also, the effect of age, sex, and duration and dosage of the drug in the pathogenesis of gingival overgrowth is not clearly understood. Some risk factors known to contribute to gingival overgrowth include the presence of gingival inflammation (i.e., gingivitis) resulting from poor oral hygiene. Presence of dental plaque may provide a reservoir for the accumulation of the drug phenobarbitone.

Other intrinsic risk factors include the presence of drug-sensitive or drug-stable subpopulations of gingival fibroblasts and keratinocytes to phenobarbitone and the number of Langerhans cells present in oral epithelium. The latter appears to be related to the presence of inflammation and dental plaque. The status of oral health prior to onset of gingival overgrowth combined with the medication are both clearly involved in the onset of drug-induced gingival hyperplasia.^{7,8} The effect of phenobarbitone on the immune system, immunological reactions mediated by T-cells may be involved in the pathogenesis of anticonvulsant-induced gingival hyperplasia.

Gingival overgrowth is characterized by the accumulation of extracellular matrix in gingival connective tissues, particularly collagenous components, with varying degrees of inflammation. Histopathologically, phenobarbitone induced drug enlargement also reveals by accumulation of extracellular matrix and ground substance, with a parakeratinised epithelial layer and deep ridges penetrating into the underlying connective tissue. As with non-enlarged gingiva, the level of inflammatory cell infiltrate varies widely.

The esthetic rehabilitation of such patients involves a multidisciplinary approach. The successful integration of esthetics and function is a result of the meticulous development of clearly defined anatomic parameter and their subsequent incorporation into the final result.⁹ Periodontal surgery is generally perceived as excisional in nature with pocket elimination being the treatment goal. An evaluation of gingival architecture and any subsequent plans for its modification should be considered to achieve a desirable gingival architecture and tooth proportion. This problem can be resolved by simply removing the enlarged gingiva, via precisely planned incisions which often produces a satisfactory esthetic result. Gingivectomy is a procedure that is performed for reduction of excessive gingival overgrowth with a simultaneous consultation with a physician for drug dosage manipulation.

The extension of gingival enlargement may be related to dose, duration and plasmatic levels of the drug. Growth is slow, but in severe cases it can increase to the point of full-tooth coverage and may result in gross displacement of teeth. Drug Induced Gingival Enlargement has only been reported occasionally in edentulous patients and in primary dentitions, but has been documented adjacent to titanium dental implants with phenobarbitone use.^{10,11} After successful treatment, the patients are advised to practiced a good oral hygiene after ultrasonic scaling and professional brushing for beneficial result.

Conclusion

Drug induced gingival overgrowth is associated with different etiologies, which must be identified before treatment. A preventive periodontal program, including dental prophylaxis and reinforcement of oral hygiene at frequent intervals can provide some benefit for outpatients taking phenobarbitone for seizure control. A thorough understanding of the pathogenesis of this unwanted side effect is essential for its prevention and treatment.

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