

## Case Report

## Management of Phenytoin Induced Gingival Overgrowth: A Case Report

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Received - 28 Sept 2021

Initial Review –3 Oct 2021

Accepted – 12 Oct 2021

## ABSTRACT

Gingival hyperplasia/ hypertrophy/ overgrowth are common terms used to describe any type of enlargement of gingiva. This overgrowth can be associated with various etiological reasons. Accordingly, it has been classified into different subheads. This can either be localised or generalised, papillary, or marginal depending on the area affected and diffuse or discrete. Inflammatory enlargements can be acute or chronic. Factors may range from inflammation due to local biofilm to neoplastic enlargements. Studies have also attributed gingival overgrowth to be associated with certain drugs (anticonvulsants, immunosuppressants and calcium channel blockers). This case report narrates the management of phenytoin induced gingival overgrowth using external bevel gingivectomy to achieve desirable esthetics.

**Key words:** *Gingival overgrowth, Phenytoin, Gingivectomy.*

Phenytoin induced gingival overgrowth is characterized by granular or nodular surface with enlargement of interdental papilla and gradually spreads to the marginal gingiva. This enlargement leads to accumulation of local factors and aggravates the condition. The size gradually reduces as it reaches to the mucogingival junction but continue to grow in coronal direction resulting in partial or complete coverage of the teeth [1]. Gingival overgrowth may lead to many problems like difficulty in oral hygiene maintenance and mastication, may alter tooth eruption, interference of speech and aesthetics issues [2,3].

The pathophysiology remains a topic of debate, some authors attribute overgrowth to the action of a sub type of fibroblasts that react with the metabolites of the drug and alter the formation as well as the destruction of collagen and the extra cellular matrix. Some authors have shown the decrease in the collagenase and Matrix metalloproteinase –

1 and 3(MMP-1 & MMP-3), which are responsible for collagen homeostasis [3]. The management of the gingival overgrowth includes consultation with the physician for drug substitution, the role of a dentist is oral hygiene maintenance protocols and the surgical correction. There are 2 options for surgical correction of these conditions, external bevel gingivectomy and the internal bevel flap surgery.

## CASE REPORT

A 25-year male patient was referred to the Department of Periodontology with the chief complaints of swelling in the gums for the past 8-9 months. On eliciting the history, the swelling had increased in size gradually over a period. The swelling initially started in the papillary region and gradually spread to the marginal gingiva. The patient also had a history of slight bleeding from the gums since 03 months. He also had a history of seizures for 2 years and is

on medication Tab. phenytoin (150mg) twice daily, for the last 2 years.

Intraoral examination revealed, gingival overgrowth on the labial aspect of the upper and lower teeth (Figure 1 & 2). His oral hygiene was poor and bleeding on probing was also present. Routine blood picture was within normal limit. Full mouth radiograph did not show any bony involvement. The substitution of the drug was sought from the physician and replaced with carbamazepine. Phase I therapy (scaling and polishing) of all teeth was done and oral hygiene instructions were given the patient. Review after four weeks revealed some reduction of the gingival overgrowth, particularly at the upper arch.

Since the complete correction was not achieved conservatively, surgical gingivectomy was planned for the upper anterior and lower anterior region. Local anaesthesia (2% lignocaine) was administered. The pocket depth was measured and marked with a Goldman fox pocket marker. Then an external bevel incision was given using #15 Bard Parker blade with 45° angulation directed towards the tooth. The excess tissue was removed and gingivoplasty

was carried out to recontour the gingiva by using #15c blade (Figure 3).

Periodontal pack was given and asked the patient to maintain oral hygiene. 0.12 % chlorhexidine mouth wash was prescribed along with analgesics and antibiotics. After 1-week, similar procedure was done for the lower anterior region. (Figure 4,5) The resected specimen was sent for histopathological examination. On seventh day of follow up visit, periodontal pack was removed. Patient was under regular follow up and at the end 12 months the results was stable without any recurrence (Figure 6,7).

### HISTOPATHOLOGICAL EXAMINATION (HPE)

Reports revealed a pronounced hyperplasia of the connective tissue and epithelium. There is acanthosis of the epithelium and elongated rete-pegs extending deep into the connective tissue, which exhibits densely arranged collagen bundles, along with an increase in new blood vessels and fibroblasts (Figure 8). There was no evidence of malignancy.



Figure 1: Pre-op (upper)



Figure 2 : Pre-op(lower)



Figure 3: Gingivoplasty (upper arch)



Fig 4: External bevel gingivectomy (lower)



Fig 5 Gingivoplasty (lower)



Figure 6: Post op 12months(upper)

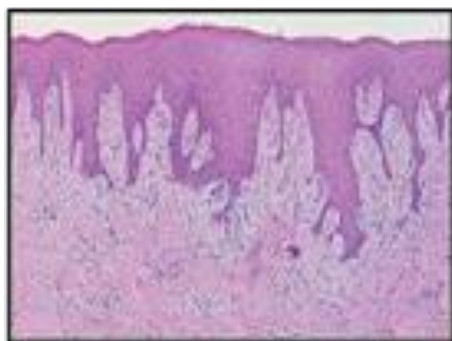
## DISCUSSION

Phenytoin is the drug of choice for treatment for grand mal, temporal lobe, and psychomotor seizures since it was first introduced in the 1930s. The first reported cases of gingival enlargement appeared in 1939, one year after it was used for treatment of epilepsy in 1938 [3]. The gingival growth usually begins as a diffuse swelling of the interdental papillae, which enlarge and coalesce, leaving a nodular appearance. There is presence of a pseudo cleft when the enlarged papilla of two adjacent teeth meets.



**Figure 7: Post op 12months (lower)**

Phenytoin selectively depresses the motor cortex of the central nervous system. It is believed to mediate this action by stabilizing neuronal discharge and limiting the progression of neuronal excitation by blocking or interfering with calcium influx across cell membranes. Reports of the incidence of phenytoin-associated gingival overgrowth range from 0% to 84.5%, with an average effect approximating 50% [4].



**Figure 8: Histopathology**

It has also been proposed that susceptibility or resistance to pharmacologically induced gingival overgrowth may be governed by the existence of differential proportions of fibroblast subsets which exhibit a fibrogenic response to these medications. In support of

this hypothesis, it has been shown that functional heterogeneity exists in gingival fibroblasts in response to various stimuli [5]. Because most types of pharmacological agents implicated in gingival overgrowth have negative effects on calcium ion influx across cell membranes, it was postulated that such agents may interfere with the synthesis and function of collagenase [6,7].

According to Seymour, factors like genetic susceptibility, histopathology, and tissue homeostasis may influence the relationship between the drugs and gingival tissues [3]. There is increased protein and collagen production by subset of fibroblasts phenytoin induced gingival enlargement [8]. Others have suggested a role of increase in non-collagenous component and a lack of collagen breakdown [9]. Role for intracellular calcium ( $Ca^{++}$ ) and folate deficiency in the pathogenesis of the gingival overgrowth has also been suggested [10,11,12]. Studies show a synergistic association between the oral hygiene and the severity of gingival overgrowth. This suggests that plaque-induced gingival inflammation may be important risk factor in the development of gingival overgrowth [2].

Treating the excessive tissue enlargement alone without considering other factors, such as the drug and local factors will not completely benefit the patient. It is essential to consider drug substitution and control of local inflammatory factors as a crucial part of management protocol. In this case report, the local environmental factors such as poor oral hygiene, may have acted as a risk factors that had contributed to the existing gingival inflammation and further leads to enlargement of gingiva and therefore complicate the oral hygiene procedures.

The first gingivectomy procedure was explained by Robicsek in 1884 and later by Zentler (1918). The gingivectomy procedure as it is employed today was described in 1951 by Goldman. Scalpel gingivectomy is the current gold standard method for correcting gingival overgrowth [13]. This is a resective technique and therefore it is most appropriate where there is minimal attachment loss, false pocketing and at least 3 mm height of keratinised mucosa apical to the base of these pockets. The other options used for this procedure is a periodontal flap surgery or use of lasers for the same in case bleeding is anticipated, however the treatment option varies from case-to-case basis.

## CONCLUSION

Gingival overgrowth leads to aesthetic concern of the patient. Their aetiology may vary from localised inflammation to malignancy. One of the causes has been attributed to drugs such as anticonvulsants, immunosuppressants and calcium channel blockers. 50% of these enlargements are due to phenytoin. There are various methods for managing this condition. Conventional gingivectomy is the treatment of choice, however substitution of the drug as advised by the physician plays an important role. The other options are use of Lasers or electrosurgery. This case report showcased the management of phenytoin induced gingival overgrowth by surgical correction in combination with drug substitution, resulting in a predictable result at the end of 12 months.

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**How to cite this article:** Lal V, Prasanth T, Pramod. Management of Phenytoin Induced Gingival Overgrowth: A Case Report. *J Orofac Res*. 2021;10(4):74-77.

*Funding: None; Conflict of Interest: None Stated.*