CASE REPORT

Nonsurgical Management of Drug-induced Gingival Overgrowth in a Young Patient

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Abstract

Background: Gingival enlargement or gingival overgrowth (GO) is a very common complication of the various classes of drugs and the most common being, the anticonvulsant drug phenytoin (PHT). PHT and its metabolites have a direct effect on the periodontal tissues; with poor oral hygiene also contributing to the severity of inflammation in patients with drug-induced gingival overgrowth (DIGO).

Case description: Here we present a case of PHT-induced gingival overgrowth (PGO) in a 12-year-old male patient and discuss the management of the condition.

Conclusion: Management of drug-induced overgrowth of gingiva includes strict oral hygiene maintenance practice, meticulous professional care with several adjunctive periodontal therapies like photodynamic therapy and Local drug delivery. Surgical treatment is indicated if the overgrown tissue has become fibrotic.

Clinical significance: The pediatric dentist plays an important role in early identification and proper management of the condition by timely intervention and collaboration with other specialists.

Keywords: Antiepileptic drug, Gingival overgrowth, Phenytoin.

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Introduction

Drug-induced gingival enlargement, or DIGO, previously known as drug-induced gingival hyperplasia, is a common side effect of different drugs where the gingival tissue is not the actual target organ. The main culprit drugs are anticonvulsants, calcium channel blockers, and immunosuppressants. GO not only restricts proper dental hygiene maintenance but also brings about cosmetic damage and causes painful chewing and eating.[1–3]

DIGO is a common problem observed in patients having systemic consumption of the above drugs and the condition is associated with the patient's genetic constitution as well as the presence of any preexisting plaque-induced gingival inflammation. It is more common in children and adolescents, with a predilection for the gingival tissue in the anterior region. The genetic constitution of an individual directly affects the pathogenesis of DIGO, with the extent and degree of condition depending upon the drug being consumed. PHT, nifedipine, and cyclosporin are the main culprit drugs, with PHT showing the highest prevalence of all. About 50% of individuals undergoing PHT therapy suffer from the condition with 30 and 20% contribution by cyclosporin and nifedipine, respectively.[4–6]

Here, we present a case in which the condition was managed nonsurgically in a young patient undergoing PHT drug therapy for epileptic seizures.

Case Description

A 12-year-old male patient came to the Department of Pedodontics with a chief complaint of bleeding and swollen gums for the past 10–12 months. He felt very uncomfortable with his appearance and the gingival swelling interfered while chewing food and brushing. He gave a history of generalized tonic–clonic seizures with the lesion in the left parietal lobe and was taking medication—PHT, 300 mg every day along with clobazam and folic acid for the last 1 year. When examined intraorally, painless, lobulated, overgrowth of the gingival tissue was seen on the labial, buccal and palatal aspects of the upper teeth and labial, and lingual aspects of the lower teeth. Bleeding on probing was present with an increase in probing depth and the presence of plaque and calculus deposits (Fig. 1).

Blood investigations presented with normal values and there was no bone loss evident on orthopantomography examination.

Patient's physician was asked to replace the drug but considering the risk of complications he refused for the same.

Initial management aimed at decreasing the plaque and calculus deposits controlling the inflammatory component of the condition by deep subgingival scaling and curettage. The patient was advised to strictly follow the home oral hygiene maintenance regimen. Deep gingival scaling and curettage were done every 6 months and the patient was followed up regularly for 2 years before his drug was tapered to minimum and had no episodes of seizures in 1 year. Gingival enlargement was significantly reduced with tapering off

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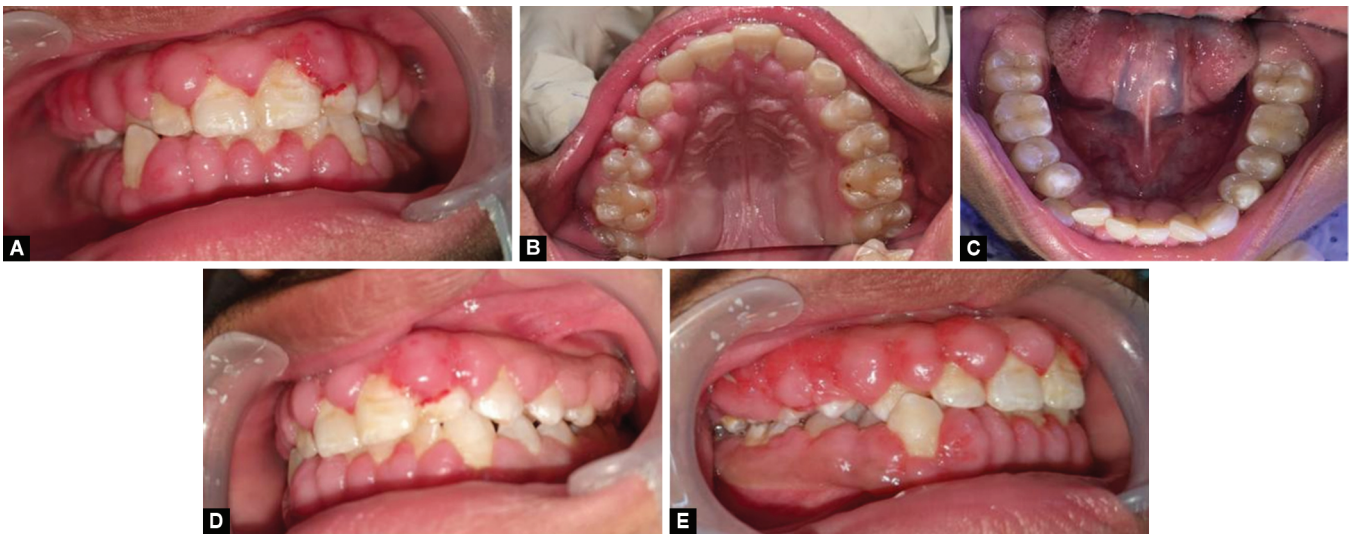
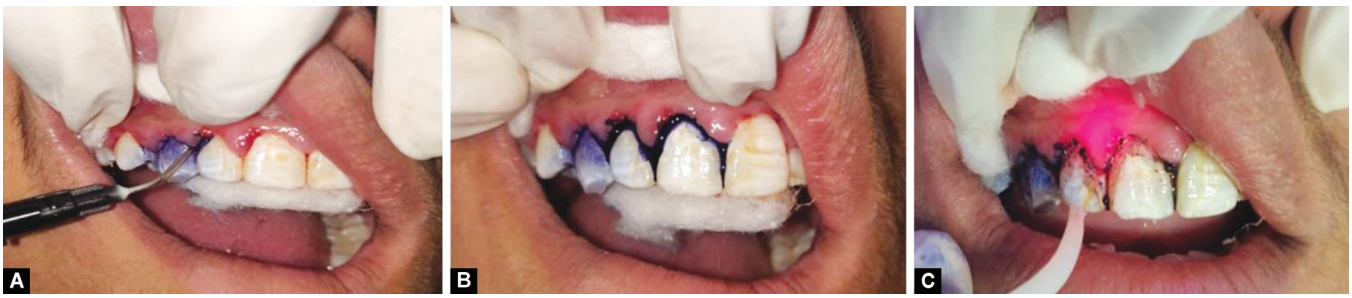
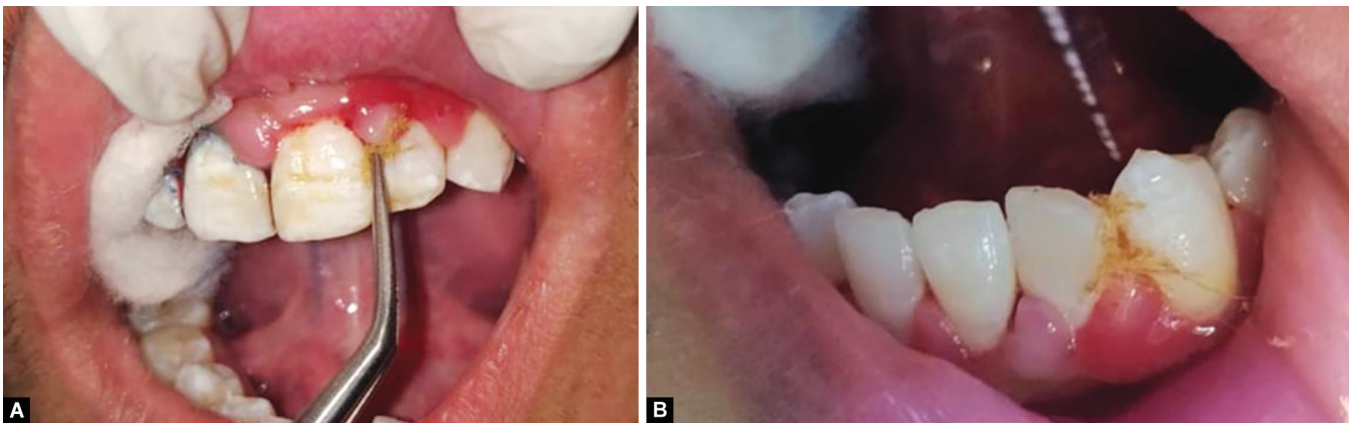


Figs 1A to E: Intraoral pictures showing PGO



Figs 2A to C: Photodynamic therapy using methylene blue dye and laser

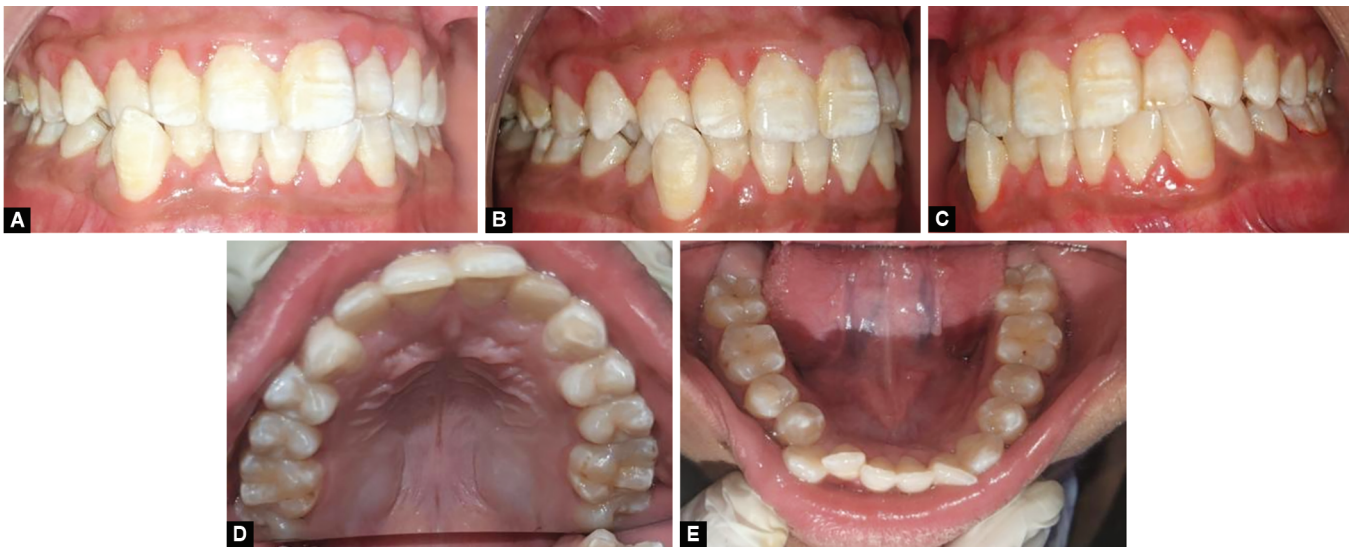


Figs 3A and B: Local drug delivery using tetracycline fibers

the PHT drug. However, there were certain segments of gingiva resistant to therapy and showed signs of chronic inflammation. Two additional therapies were given—photodynamic therapy (Fig. 2) and local drug delivery with tetracycline fibers (Fig. 3) provided significant relief to the patient within 1 month and the condition was completely resolved at the end of the treatment (Fig. 4).

Discussion

Epileptic disease is characterized by recurrent episodes of seizures in an individual caused due to some form of underlying pathology in the brain and currently available antiepileptic drugs depress the activity of neurons at their foci of the origin or act by blocking the spreading of the action potential. PHT also called 5,5-diphenylhydantoin, is an antiepileptic drug, introduced in the year 1938, which is slowly absorbed from the gastrointestinal tract and gradually accumulates in the brain, 5–10 times higher than the levels found freely in the blood. It is considerably metabolized by microsomal enzymes in the liver, leading to the production of a major metabolite, 5-(p-hydroxyphenyl—5PPHH) that acts either by stabilization of the cell membrane of the neurons or through suppression of transmissions at the synaptic junction. PHT also acts by affecting the sodium–potassium pump, calcium, and sodium influx at the cellular level. PHT-induced gingival enlargement shows variable prevalence ranging from



Figs 4A to E: Intraoral pictures after the condition has resolved

13 to 50%, in community studies on hospitalized individuals. In the present case, the individual's poor oral hygiene had an additional impact on PHT tissue response thus causing the enlargement.[4–8]

A 12-year-old male patient reported chief complaints of swelling and bleeding of gums for the past 10–12 months. The patient gave a history of epileptic seizures and he was on medication, PHT 300 mg od since then. Medical history and intraoral examination were conclusive of the provisional diagnosis as PHT-induced gingival enlargement. All local factors were removed using professional mechanical periodontal therapy and the physician was consulted for an alternate drug regimen for the treatment of the disease. Patient's physician refused the change in the drug considering the risk of complications. The patient was given strict instructions for proper home oral hygiene maintenance, and the right brushing techniques were taught to him. He was recalled after 15 days and showed some reduction in inflammation, particularly in the lower arch. Deep gingival scaling and curettage was done every 6 months and the patient was on regular follow-up for 2 years until the PHT dose was reduced to the minimum amount by the physician. With the reduction of the drug dose, there was a significant improvement in the condition but certain segments of gingiva were chronically inflamed. Local drug delivery and photodynamic therapy were used (split mouth) twice at interval of 2 weeks and the condition significantly resolved within 1 month.

The primary aim of local drug delivery is to place the antibiotic or antiseptic directly in contact with the root surface, in deep periodontal pockets which harbor periodontal pathogens that are not accessible by mechanical therapy and are responsible for intense tissue destruction.[9]

Photodynamic therapy involves the use of low-power laser light, a photosensitizer, singlet oxygen, and free radicals. Irradiation of photosensitizer with a specific wavelength of light leads to the generation of free radicals that are cytotoxic to bacterial cells causing periodontal disease.[9]

The clinical importance of presenting this case is that DIGO can be successfully managed nonsurgically in young patients simply with adequate plaque control and adjunctive periodontal therapies plus the condition usually resolves with the tapering off the drug therapy. However strict patient compliance and meticulous professional supervision are of utmost importance.

Surgical intervention, that is, gingivectomy is not to be always rushed for and is the treatment of choice only in cases with a fibrotic component. In cases requiring surgical treatment, recent studies have shown the association between GO and epithelial-mesenchymal transition (EMT) where epithelial cells differentiate into fibroblast-like cells. The elevated levels of EMT markers in the PGO lesions suggest that EMT contributes in human GO and fibrosis. Other animal studies have also shown the role of cytokines and interleukins in the fibrotic processes. For management of fibrotic GO gingivectomy either by traditional electrocautery or more recently by lasers is the treatment of choice.[10]

Management of DIGO is based on strict plaque control to reduce the inflammatory component with surgical removal of fibrosed gingival tissue, surgery being repeated at several intervals, if the condition shows an insidious and progressive nature. As PHT is the most commonly used drug for epilepsy treatment, adjusting it to the levels where epileptic seizures can be effectively controlled is a lengthy, complex process, and neurologists are mostly determined not to change the ongoing anticonvulsant treatment regimen.

Conclusion

The pediatric dentist plays a very important role in the early identification of the condition, proper management of the condition by timely intervention, and appropriate collaboration with neurologists, periodontists, and oral surgeons, and much required patient counseling and motivation.

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