

Gingival Overgrowth in A 7-Year-Old Boy with Nephrotic Syndrome: A Case Report

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Abstract

In general, gingival overgrowth in children can be caused by several conditions or systemic factors, namely inflammatory gingival overgrowth, drug-induced gingival overgrowth, overgrowth associated with systemic diseases or conditions, neoplastic overgrowth, and false overgrowth.

Drug-induced gingival overgrowth is defined as abnormal gingival growth resulting from unwanted side effects due to the consumption of certain medications, such as immunosuppressants, calcium channel blockers, and anticonvulsants.

This gingival overgrowth in children will directly affect their mastication, aesthetics, and oral hygiene. It requires interdisciplinary cooperation from fellow specialists and special attention from parents and patients. A dentist needs adequate knowledge of dental management to handle this case.

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Introduction

Nephrotic syndrome (NS) is one of the chronic illnesses in the pediatric age group. This disease is a collection of symptoms caused by kidneys not functioning correctly. Symptoms include 1) massive proteinuria (protein levels in the urine), 2) hypoalbuminemia (low protein levels in the blood), 3) hyperlipidemia (high-fat levels in the blood), and 4) edema. Edema is swelling because proteins in the blood act as a sponge to hold fluid, which leaks out of the blood into the tissues.^{1,2}

Nephrotic syndrome is relatively common in children. The disease can affect children of all ages, from infants to adolescents, especially between the ages of 1 and 6. It is estimated that every year, there are 2-7 new cases of NS in 100,000 healthy children under 18 years of age. In the young age group, boys have a higher

prevalence of NS than girls, but in the young adult group, there is no significant difference between genders.³⁻⁶

The disease results from damage to the glomerulus, the part of the kidney that filters blood and produces urine. Other causes are diseases that cause damage to the kidneys, namely diabetes, lupus, rheumatoid arthritis, amyloidosis, erythema multiforme, Sjogren's syndrome, and infectious diseases (syphilis, HIV, malaria, hepatitis, etc.), as well as the consumption of drugs that affect the work of the kidneys, such as nonsteroidal anti-inflammatory drugs or alpha interferon. Long-term use of cyclosporine has been linked to an increased risk of unpleasant side effects, including gum hypertrophy.⁷

Children with NS have many oral manifestations, such as ammonia-smelling breath, impaired taste, stomatitis, xerostomia, parotitis, decreased salivary flow, increased plaque accumulation, and gingival enlargement associated with drug therapy. There may also be enamel opacities and hypoplasia due to impaired calcium and phosphate metabolism.⁸ In addition, children with NS are also at high risk of poor gum health due to frequent hospital visits, which may lead to neglected oral hygiene. The patient's attention, especially the parents, is more focused

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on the treatment of the systemic disease. Immunosuppressants taken by nephrotic syndrome patients can alter the inflammatory response of gingival tissue to bacterial plaque.⁹

This paper aims to report a case of a 7-year-old boy suffering from Nephrotic Syndrome who was found to have an enlarged gingiva on intraoral examination. Dental management of the patient was carried out based on the treatment guidelines of the case, resume of general condition, intraoral examination, and treatment. This paper may provide additional information for dentists when managing pediatric patients with drug-induced gingival overgrowth.

Case Report

A 7-year-old boy and his mother came to the clinic with complaints of swollen front gingiva and crowded front teeth. His mother was worried about the condition of his oral cavity. Based on anamnesis, it was known that the patient had a history of nephrotic syndrome, with initial symptoms in the form of swelling of the palpebra, and until now, still under the care of a pediatrician at the hospital. About 1 year after taking the medication given by the treating doctor, the front gingiva began to swell. The patient was planned to undergo treatment for his systemic disease for seven cured and has only been four cured. There was no family history of nephrotic syndrome.

The history of treatment received by the patient over the last 2 years is as follows: Sandimmun (Cyclosporine) 100 mg 2 times/day, Aspilet (Acetylsalicylic acid) 40 mg 1 time/day, Calnic syrup 5 ml 1 time/day, Diltiazem 45 mg 2 times/day, Teorol (Cholecalciferol) 400 IU 1 time/day, Lupred (Prednisolone) 15 mg 1 time/day, Myfortic 360 mg 2 times/day. The attending pediatrician instructed the patient to regularly visit the hospital for general physical examination, laboratory check, albumin correction, Lasix, urine control, and Cyclophosphamide treatment.

Intraoral examination revealed clinical symptoms such as gingival overgrowth in the anterior region of the maxilla and mandible, with pink colour, dense consistency, and nodularity (Figure 1A, 1B, 1C). The maxilla showed more obvious swelling than the mandible. Persistence of 2 mandibular lateral incisors. There was a plaque in the anterior region of the maxilla and

mandible. His mother said that the patient regularly brushed his teeth twice a day. Patient was free of caries.



Figure 1A., 1B. gingival overgrowth in the anterior region of maxilla and mandible.



Figure 1C. Persistence of 2 mandibular lateral incisors.

Dental Management

Early evaluation of the oral status of children with chronic renal failure (CRF) is essential to limit possible infections in the oral cavity. At the first visit, the mother and patient are given a general understanding of the

pathogenesis of the disease, leading to enlarged gingivae. As this condition is entirely drug-induced, patient education on the side effects of the drugs involved before starting treatment is necessary, and the importance of good dental hygiene should be emphasized. It is also important to mention that drug-induced gingival enlargement has a good prognosis and is generally reversible after stopping or replacing the drug that caused it.

The next instruction is Dental Health Education (DHE). The DHE material contains information on diet control, oral hygiene maintenance (toothbrush selection, brushing techniques should be gentle, fluoride toothpaste should be used, tongue brushing, flossing), non-alcoholic mouthwash for children, and periodical checking. Mouthwash is used to maintain oral hygiene and prevent caries. As xerostomia is common in CRF patients, stimulating saliva secretion with vigorous mastication can be helpful and easy to understand and obtain, even for children.

The patient was also given plaque removal in the upper and lower anterior regions through minimally invasive scaling. Furthermore, the patient was given home care instructions to maintain oral hygiene. The patient was also consulted with the treating pediatrician for possible replacement of sandimmun and diltiazem with other drugs or dose modulation to minimize gingival enlargement.

At the next visit, the patient was extracted with an injection of the persistent mandibular lateral incisor deciduous tooth. The patient was instructed to visit the dentist regularly, at least once every 3 months, for a professional dental cleaning or before that if there were any complaints. Routine appointments are also aimed at controlling and monitoring the possibility of infection.

Discussion

Gingival overgrowth caused by drug ingestion is an undesirable side effect of systemic treatment on periodontal tissues. It was first reported in the early 1960s in the dental literature and referred to as drug-induced gingival enlargement or overgrowth. Gum overgrowth will cause the gums to swell and become inflamed. The exact mechanism varies depending on the drug but generally involves a combination of cell

growth and inflammation within the gingival tissue. The most commonly involved drugs are anticonvulsants such as phenytoin, immunosuppressants like cyclosporine, and calcium channel blockers, notably nifedipine and amlodipine. This condition is associated with the patient's genetic predisposition and plaque or gingival inflammation. This is substantiated as some individuals develop gingival overgrowth, and some do not while on the same drug.¹⁰⁻¹³

These clinical symptoms arise when these drugs alter the metabolism of gingival fibroblasts, leading to extracellular matrix deposition and excessive tissue proliferation. The condition usually appears as complicated, fibrotic gingival tissue that can cover the teeth, causing aesthetic and functional problems, including difficulty in maintaining oral hygiene and an increased risk of periodontal infection. The severity varies based on individual susceptibility, drug dosage, and contributing factors such as oral hygiene status and genetic predisposition.¹⁴

Similar to the patients above, some research suggests that children with nephrotic syndrome have a lower caries prevalence than healthy children. This may be due to an increase in salivary pH due to an increase in urea (or ammonia). This phenomenon will produce an environment that favors remineralization and reduces demineralization. This mechanism also reduces caries due to its antibacterial properties and the effect of inhibiting plaque formation.¹⁵

Drugs that are concentrated in the gingival sulcus fluid or bacterial plaque will have a direct toxic effect on the gingival tissue. Dental plaque can trigger inflammation, which will lead to gingival overgrowth. Inflammation leads to upregulation of transforming growth factor-beta 1. Therefore, dental plaque control is necessary to treat and prevent gingival enlargement from progressing over time. Plaque control should be the first step in treating drug induced gingival overgrowth, proper oral hygiene, and professional plaque removal, including periodic tooth surface cleaning and scaling. Inflammation control, including administering non-steroidal anti-inflammatories, antibiotics to control infection, and topical anti-fungal medications such as nystatin, can also be used when necessary.^{16,17}

Treatment of gingival enlargement aims to relieve the patient's discomfort so that they can perform simple basic actions such as eating and chewing without pain, treat inflammation,

reduce swelling, and improve aesthetics. Treatments that can be done are medical and surgical. Medical management is the first-line therapy, while surgery is only performed for recurrence or cases that persist despite good medical treatment. Discontinuation, replacement, or modulation of drug dosage should be considered by the doctor treating the systemic disease. Diltiazem and verapamil showed a lower prevalence of gingival enlargement compared to nifedipine—alternative drugs of choice to phenytoin include carbamazepine and valproate acid.^{8,19}

Surgical methods include gingivectomy and periodontal flap surgery. Electrocautery may be used in complex cases, children, or when the gingiva is fragile and prone to bleeding. Before any surgical intervention, children with CRF should have their oral cavity sanitized and cleaned. Dental treatment should be carefully and gradually planned. Dental treatment in general, and pediatric dental treatment in particular, is often a source of anxiety and fear. Antibiotic prophylaxis, usually with Vancomycin, is recommended before any invasive procedure on the patient. Lasers are preferred over scalpels as they have strong bactericidal and haemostatic effects. Gingival tissue can normalize with adequate plaque control and medication changes, but surgical treatment is sometimes required to restore normal gingival contours. Recurrence may occur between 3-6 months after the procedure. An interdisciplinary approach is needed as the primary physician, dentist, and healthcare team should adequately address the patient's signs and symptoms.^{14,20}

Conclusions

Dental management in patients with nephrotic syndrome is critical to be done correctly and appropriately because oral manifestations in these patients are often reported. Dentists need to have a good understanding of dental management. This includes the general condition of the patient, the pathophysiology of the disease, possible risks due to dental and oral interventions, patient education, preventive measures, dental and oral care, and interdisciplinary cooperation with expert colleagues.

Declaration of Interest

The authors report no conflict of interest.

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