

Management of gingival enlargement by medical & non surgical dental therapy in a cerebral palsy patient - A case report

Divya Singh Hada^{1,*}, Subhash Garg², Shaleen Khetarpal³, Madhu S. Ratre⁴

¹PG Student, ²Professor & HOD, ³Lecturer, ⁴Reader, Dept. of Periodontology, Government College of Dentistry, Indore, Madhya Pradesh, India

***Corresponding Author:**

Email: dr_dshada@yahoo.com

Abstract

Gingival enlargement develops as an exaggerated response of periodontal tissues to local factors like dental plaque and dental calculus. Systemic conditions like cerebral palsy, where mental deficiency and loss of manual dexterity is a contributing factor for poor oral hygiene, sometime manifest as gingival enlargement. Nutritional deficiency in combination to systemic disease and conditions, further contributes to an altered response of periodontal tissues to dental plaque and calculus, which may sometimes clinically manifest as gingival enlargement (generalized or localized). Vitamin C deficiency presents with various oral manifestations, specially causing conditioned gingival enlargement. Anemia is also one of the systemic disease/conditions affecting periodontal tissues. Management of these various conditions manifesting as gingival enlargement, warrants diagnosis and treatment of the underlying cause. It becomes more challenging when all these conditions co-exist, demanding a holistic comprehensive approach, not only for addressing the patient's chief complaint, but also, improving the overall oral and general health as well. This case report is an attempt to discuss the management of an unusual case of massive gingival enlargement mainly due to vitamin C deficiency in an anemic cerebral palsy pediatric patient.

Keywords: Anemia, Ascorbic acid deficiency, Cerebral palsy, Gingival overgrowth.

Key Messages: Maintenance of proper oral hygiene and nutritional supplementation is essential for overall health of cerebral palsy patient.

Introduction

Gingival diseases are most common diseases known to mankind since the development of civilization. Gingivitis is a periodontal disease with no attachment loss, plaque biofilm being the main etiologic agent. By effective oral hygiene, gingivitis is reversible but, if left untreated results into periodontitis (tissue and bone destruction, and ultimately tooth loss). Periodontitis is always preceded by gingivitis, but not all cases of gingivitis progress to periodontitis. In India the prevalence of periodontal disease is nearly 80%.¹

Gingival enlargement or overgrowth is an increase in the size of the gingival epithelium and/or connective tissue. A closely related generic term is an Epulis, which represents a localized tumor like growth of gingiva. Based on etiology, gingival enlargement can be classified as inflammatory, drug induced, neoplastic, false, and enlargements associated with systemic disease and conditions. Conditions like pregnancy, puberty, vitamin C deficiency leads to enlargement of gingiva.

Prolonged deficiency of vitamin C (water soluble micronutrient) leads to scurvy, characterized by bright red, edematous and bleeding gingiva. Scurvy has been known since ancient times and documented as a disease by Hippocrates. It was common amongst sailors. The deficiency leads to an inability to produce intercellular ground substance such as collagen (affecting hydroxylation of proline), resulting in widespread pathology of supporting tissues of blood vessels, bone, and teeth, with increased permeability of the capillaries

to red blood cells causing haemorrhages. Vitamin C deficiency does not cause gingivitis or periodontitis by itself, but it does increase the severity of gingivitis.² It aggravates gingival response to plaque, worsen the edema, and causes gingival bleeding. This exaggerated response is partially by host bacterial interaction and partially by vitamin C deficiency. Severe deficiency leads to scorbutic gingivitis; characterized by ulcerative gingivitis, rapid periodontal pocket formation, and tooth exfoliation.

Evidences have shown anemia as a systemic cause of periodontal diseases.³⁻⁵ Anemia is defined as a state of reduced hemoglobin (Hb) concentration, reduced number of circulating erythrocytes in the blood, or both. A relative decrease in oxygen into the tissues has been suggested to act as a modifying factor in the response of the periodontium to local irritation in anemia. Chronic inflammation, infections, or tumors disturb iron homeostasis causing anemia of chronic disease (ACD). Also, this may be attributed to down-regulation of erythropoiesis by proinflammatory cytokines produced in chronic inflammation. Anemia is regarded as an important health care problem around the world because it affects mental and physical development.

Cerebral palsy (CP) is a group of permanent, non-progressive disorders that cause physical disability, mainly in the areas of body movement. Difficulty with cognition and epilepsy are found in about one-third of such cases. CP occurs during pregnancy, childbirth, or after birth up to about age three. CP is neither an infectious disease

nor contagious, occurring in about 2.1 per 1,000 live births. Poor motor control and manual dexterity make it difficult to achieve and maintain a high standard of oral hygiene and gingival health in such patients⁶ leading to gingival and periodontal disease.

All these factors like lack of manual dexterity, intellectual disability, anaemia, vitamin C deficiency may cumulatively contribute to massive gingival inflammatory enlargement. This case report describes an unusual case of massive gingival enlargement mainly due to vitamin C deficiency in an anemic cerebral palsy pediatric patient.

Case History

A 12 year old female patient was referred to the Post graduate Department of Periodontology, Government College of Dentistry, Indore from Department of Pediatrics, Maharana Yashwantrao Hospital (MYH), Indore for management of multiple gingival enlargements. The chief complaint of the patient as presented by her guardians (as she is not residing with her parents) was multiple areas of swelling on the gums, bleeding from gums spontaneously, and difficulty in chewing food since the past 1 month.

Medical history suggested her to be suffering from cerebral palsy since birth, with quadriplegia along with severe mental and physical growth retardation. Multiple hypoxic areas in the brain were observed on magnetic resonance imaging (MRI).

On intraoral examination multiple gingival enlargements involving premolar - molar teeth, on both maxillary and mandibular arches bilaterally were present. Gingival enlargements were reddish blue in colour, exhibited smooth and shiny surface, soft and edematous in consistency, roughly of 1x1x1 cm³ in size and spontaneous bleeding on probing present. Degree of gingival enlargement was Grade III⁷, as they extended upto the occlusal levels with indentations of opposing teeth and localized ulcerations on their surface at level of occlusal plane was observed. Pseudo/gingival pockets recorded were between 5 to 12 mm.

Blood profile depicted hemoglobin (Hb) 08gm% and blood cell picture microscopically showed abnormal anisocytic, poikilocytic, and hypochromic cells suggesting iron deficiency anemia. The vitamin C level was 0.2 mgm/dL and was found to be deficient.

A provisional diagnosis of conditioned gingival enlargement secondary to vitamin C deficiency and anemia was arrived based on a complete medical history, clinical findings, and biochemical parameters. This was aggravated by poor oral hygiene of the patient due to inadequate manual dexterity observed in cerebral palsy patients.

Initially, the patient was planned to be surgically managed under general anaesthesia (GA) for excision of massive gingival overgrowths. As hypoxic areas

were found on brain MRI, it was not considered safe for the patient to be operated under GA, by the anesthetic. Thus, patient was attempted by medical and nonsurgical dental therapy in collaboration with Department of Pediatrics, MYH Indore. For the management of anaemia two units of 450 ml of whole blood transfusion were performed. Nutritional deficiency of vitamin C and other micronutrients was treated by prescribing tablets of vitamin C and sodium ascorbate[†] (100+450 mg) for 30 days. Periodontal management comprised of evaluation of local factors like plaque and calculus. Only soft deposits were observed, which were removed by cotton swab dipped in 0.12% chlorhexidine gluconate (CHX) solution[‡] and by removal of remaining soft and hard deposits with the help of supragingival hand scalers. Use of powered toothbrush[§] was demonstrated to the guardians and emphasis on the maintenance of proper oral hygiene was stressed. Instructions were given to brush patient's teeth twice daily using the powered toothbrush and 0.12% CHX solution to be used twice daily for cleaning patient's mouth. For alleviating her pain and discomfort analgesic tablet Ibuprofen (200 mg) thrice daily and antibiotic capsule Amoxicillin (250 mg) thrice daily were prescribed for 5 days to be taken under guardian's supervision. The patient was kept on maintenance phase and recalled after every 1 month for a period of 6 months.

Marked reduction was observed in size of gingival enlargements in just 10 days with significant amount of regression of lesions in 6 months. Patient was much comfortable while eating food, and showed improvement in her general health as well. Education and motivation of patient's guardian regarding importance of oral health with nutritional supplements of vitamin C and improved Hb level along with non surgical periodontal therapy had a beneficial and critical role to play in overall management of intellectually disabled patients with special health care needs.



Fig. 1: Patient photograph



Fig. 2: Pre-treatment - right side view showing massive gingival enlargement



Fig. 3: Pre-treatment - left side view showing massive gingival enlargement



Fig. 4: During treatment - 10 days after vitamin C supplements and non-surgical periodontal therapy right side view showing considerable amount of regression in size of gingival enlargement



Fig. 5: During treatment - 10 days after vitamin C supplements and non-surgical periodontal therapy left side view showing considerable amount of regression in size of gingival enlargement



Fig. 6: Post-treatment after 6 months - right side view showing significant amount of regression in size of gingival enlargement



Fig. 7: Post-treatment after 6 months - left side view showing significant amount of regression in size of gingival enlargements observed

Table 1: Laboratory Investigations

RBC per c.mm	39.50 lakh
Hemoglobin percent	50= 8.00 gms (normal 11-16 gm/dL)
Color Index	0.63
PCV	27.00 (normal 38-46)
MCV	68.35 (normal 82-96)
MCH	20.25 (normal 29-32)
MCHC	29.62 (normal 32-37)
WBC per c.mm	10,850 (normal 3800 – 11000 / mm ³)
Lymphocytes	34.5
Monocytes	01.5
Neutrophils	61.0
Eosinophils	03.0
Basophils	00.0
Abnormalities in RBC	Slight Anisocytosis, Poikilocytosis & moderate degree of hypochromia
Platelet count per c.mm	2.10 lakh (normal 1.5-4.0)
Malaria Parasite	Not found

PT	12.5 sec (normal 11-13.5 sec)
APTT	12.5 sec (normal 21-35 sec)
INR	1.00 (normal 0.8- 1.1)
Vit C	0.2 mgm/dL (normal 0.6-2 mgm/dL)

Discussion

An oral hygiene practice is a voluntary physical activity with two basic requirements motivation and manual dexterity.⁸ Poor oral hygiene is more prevalent among mentally retarded persons as compared to normal individuals.⁹ An inverse relationship between mental retardation and oral hygiene status is also observed.^{10,11} In disabled children provision and supervision of oral hygiene by parents is lower than normal children.¹² Mechanical control of dental plaque in disabled children is difficult, time consuming, and ineffective. Lack of parental education and motivation leads to gingival and periodontal diseases, affecting overall nutritional status.^{13,14}

Effectiveness of manual and powered toothbrushes is limited by manual dexterity and skill of user,¹⁵ out of which powered tooth brushes are considered to be most effective for patients with poor manual dexterity. As a result, chemical plaque control is recommended as an alternative & adjunctive to mechanical plaque control in these special patient groups.¹⁶ Effectiveness of CHX is widely investigated and thus defined as Gold Standard.¹⁷⁻¹⁹ Combination of chemical & mechanical plaque control is more beneficial than mouthwash alone^{20,21} for patients having special care needs.

It was observed in a case of CP, child developed gingival hyperplasia due to poor oral hygiene practice which remarkably improved by proper motivation and adaptation of oral hygiene measures.²² Integrated approach used during dental treatment by enabling the application of knowledge from the fields of dentistry, physical therapy, and speech therapy also helped to provide a better quality of life for CP patient, and consequently the caregiver through the improvement in the patient's oral and general health.²³ These findings are supported with the help of this case report. Guardians belongs to low socioeconomic background and unaware of the importance of proper oral hygiene practices on overall health of the patient. Low socioeconomic status and various nutritional deficiencies, along with the lack of awareness, and no use of any oral hygiene measures by the patient can be further accounted for inflammatory component of gingival hyperplasia which has aggravated in response to underlying nutritional deficiency of vitamin C. Spontaneous healing of gingival hyperplasia was noted in just 10 days after adoption of chemical and mechanical plaque control measures, along with nutritional supplements of vitamin C and blood transfusion. Significant amount of regression of oral lesions was seen in 6 months post treatment. Lack of education and motivation of guardian is considered to be responsible for poor oral hygiene status of patient

and such a massive gingival enlargement. Thus, by addressing possible attentions could improve the dental and general health of the patient.

Conclusion

Anaemia is most common among Indian population, not only among adults but also younger age groups. Malnourishment secondary to poor socio economic strata may be an attributing factor to vitamin C deficiency and anemia. In CP patients there is altered manual dexterity, making oral hygiene maintenance difficult.

An integrated team approach comprising of dentist, physician, and parents is paramount in successful management of not only the systemic condition of patient but, also oral hygiene and periodontal health, thereby enhancing the overall health and wellbeing of the patient.

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Conflict of interest: None to declare

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