International Journal of Enhanced Research in Medicines & Dental Care (IJERMDC),
ISSN: 2349-1590, Vol. 13 Issue 5, May 2026

Periodontal Management of Inflammatory Gingival Enlargement in a Patient with β-Thalassemia Major: A Case Report

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ABSTRACT

β-thalassemia major is associated with chronic anaemia, repeated transfusions, iron overload, and altered immune responses that may adversely affect periodontal health. A 28-year-old female with β-thalassemia major presented with generalized inflammatory gingival enlargement, bleeding on brushing, poor oral hygiene, and probing pocket depths of 4–6 mm. Following physician consultation and blood transfusion, non-surgical periodontal therapy comprising oral hygiene reinforcement, scaling and root planing, and chlorhexidine mouthrinse was performed. Follow-up revealed marked reduction in gingival enlargement, inflammation, and bleeding, with improved oral hygiene. This case highlights the effectiveness of individualized non-surgical periodontal therapy, interdisciplinary care, and strict plaque control in managing gingival enlargement in patients with β-thalassemia major.

Keywords: β-thalassemia major; gingival enlargement; periodontal therapy; medically compromised patient.

INTRODUCTION

Thalassemia is an inherited hemoglobinopathy caused by defective globin chain synthesis, resulting in ineffective erythropoiesis and chronic haemolytic anaemia[1]. β-thalassemia major is the most severe form and often requires lifelong blood transfusions and iron chelation therapy. Its systemic effects, including skeletal deformities, hepatosplenomegaly, endocrine dysfunction, and increased infection risk, can significantly affect oral and periodontal health[2,3]. Oral findings commonly include maxillary enlargement, spacing, malocclusion, pale oral mucosa, and a higher prevalence of periodontal disease. Chronic anaemia, altered immunity, iron overload, and impaired vascular response may predispose these patients to gingival inflammation and enlargement[4,5].

Gingival enlargement may be inflammatory, drug-induced, systemic, or neoplastic in origin[6]. In thalassemia patients, it is often multifactorial, with plaque-induced inflammation as the main contributor, further aggravated by fear of bleeding, poor oral hygiene, and altered host response[7]. Histologically, inflammatory gingival enlargement is associated with epithelial hyperplasia, increased vascularity, inflammatory cell infiltration, and, in longstanding cases, fibrotic changes due to collagen deposition and reduced matrix degradation[8–10]. Because gingival enlargement in medically compromised patients may reflect both local and systemic influences, careful differentiation and individualized management are essential[11–13].

Periodontal care in thalassemia must consider haemoglobin status, bleeding tendency, immune function, and timing of treatment relative to transfusion cycles[14,15]. Gingival enlargement not only compromises esthetics but also creates plaque-retentive areas that worsen inflammation and periodontal breakdown[6]. Management requires strict plaque control, nonsurgical therapy, and, when necessary, surgical intervention in coordination with the patient's physician[16,17].

This case report presents the periodontal management of gingival enlargement in a 26-year-old female patient with thalassemia, emphasizing individualized treatment planning and interdisciplinary care.

CASE REPORT

A 28 year old female patient came with the chief complain of gingival swelling in left upper tooth region , in lower front (lingually) tooth region and right lower back tooth region since 2 months.

The patient was a known case of β-thalassemia major diagnosed during childhood and had been under continuous medical supervision. The patient had been receiving regular blood transfusions every 3–4 weeks and was undergoing iron chelation therapy with deferasirox for the management of transfusion-related iron overload. Medical history did not reveal the presence of systemic conditions such as diabetes mellitus or hypertension. There was no history of splenectomy and no known drug allergies were reported. Furthermore, the patient had no history of medications commonly associated with drug-induced gingival enlargement, such as phenytoin, cyclosporine, or calcium channel blockers. Medical clearance for periodontal treatment was obtained from the patient's physician before initiation of therapy.

Recent haematological investigations revealed haemoglobin levels ranging between 8–9 g/dL, with comparatively higher levels observed following blood transfusion. White blood cell count, platelet count, bleeding time, and clotting time were within normal physiological limits.

The patient also reported inadequate oral hygiene maintenance, with brushing performed only once daily using a horizontal scrubbing technique. No interdental cleaning aids were used, and the patient had not undergone any professional periodontal therapy during the previous two years.

On extraoral examination, mild facial pallor suggestive of anaemia was observed. No facial asymmetry or lymphadenopathy was detected. Intraoral examination revealed generalized gingival enlargement, which was more pronounced in the mandibular anterior region (Grade II) and maxillary premolar region (Grade III). The enlargement was diffuse and marginal in nature, extending into the interdental papillae. In certain areas, particularly in the maxillary premolar region, the gingival overgrowth covered up to one-third to one-half of the clinical crown height. The gingival tissues appeared erythematous and oedematous in the inflamed areas, with bleeding elicited on probing.

Periodontal examination demonstrated poor oral hygiene status, with a Plaque Index score of 2, indicating moderate to severe plaque accumulation. Generalized gingival inflammation was evident. Probing pocket depth ranged from 4 to 6 mm in the affected sites, accompanied by mild to moderate clinical attachment loss. Notooth mobility or furcation involvement was observed.

PROVISIONAL DIAGNOSIS

Based on clinical and radiographic findings a diagnosis of Generalized inflammatory gingival enlargement associated with plaque-induced chronic gingivitis in a medically compromised patient (thalassemia).

TREATMENT PLAN

Prior to initiation of periodontal therapy, treating physician's consent was obtained considering the patient's underlying systemic condition. Treatment appointments were scheduled shortly after blood transfusion sessions, preferably on the following day, to ensure optimal haemoglobin levels during dental procedures. In addition, tranexamic acid intravenous therapy was administered as prescribed by the physician one day before each dental appointment. Strict infection control measures were maintained throughout the treatment period[19].

Phase I periodontal therapy was initiated with comprehensive oral hygiene instructions. The patient was advised to use a soft baby toothbrush to minimize trauma to the enlarged gingival tissues during brushing. Full-mouth scaling and root planing were performed under antibiotic coverage (2gm of amoxicillin given orally as a single dose 60 minutes before the procedure). Chlorhexidine mouthwash (0.12%) was prescribed twice daily for a duration of two weeks. During the first visit, localized supragingival scaling was carried out in the mandibular anterior region, which was identified as the area with the highest inflammatory burden. Following this procedure, the patient reported a reduction in pain within two days. During the second visit, scaling and root planing were performed in the maxillary anterior region after an interval of 15 days. Subsequently, full-mouth subgingival scaling was completed during the third visit under antibiotic prophylaxis, wherein 500 mg of amoxicillin was administered 60 minutes prior to the procedure. Local haemostatic agent AbGelwas kept readily available throughout the treatment sessions to manage any potential bleeding complications.

Revaluation

First re-evaluation was done after 1 week, then after 3-4 weeks. There was Significant reduction in inflammation, Decrease in gingival enlargement , Improved plaque control after 4 weeks.

DISCUSSION

β-thalassemia major is a hereditary hemoglobinopathy characterized by defective β-globin chain synthesis, resulting in chronic haemolytic anaemia, ineffective erythropoiesis, and lifelong dependence on blood transfusions. These systemic alterations, along with iron overload and immune dysfunction, may significantly influence periodontal health and host inflammatory response. In the present case, the patient exhibited generalized inflammatory gingival enlargement associated with poor plaque control in the background of β-thalassemia major. The successful management achieved through non-surgical periodontal therapy emphasizes the importance of meticulous periodontal care and interdisciplinary management in medically compromised patients[3].

The gingival enlargement observed in this case appeared to be predominantly inflammatory in nature, aggravated by plaque accumulation secondary to inadequate oral hygiene practices. The patient reported fear of bleeding during tooth brushing, which resulted in ineffective plaque control and subsequent progression of gingival inflammation. Similar findings were reported by Baiju et al., who described gingival enlargement in a β-thalassemia major patient associated with poor oral hygiene maintenance and exaggerated inflammatory response[20].The authors emphasized that altered oral hygiene practices due to fear of bleeding may contribute significantly to gingival inflammation in thalassaemic individuals.

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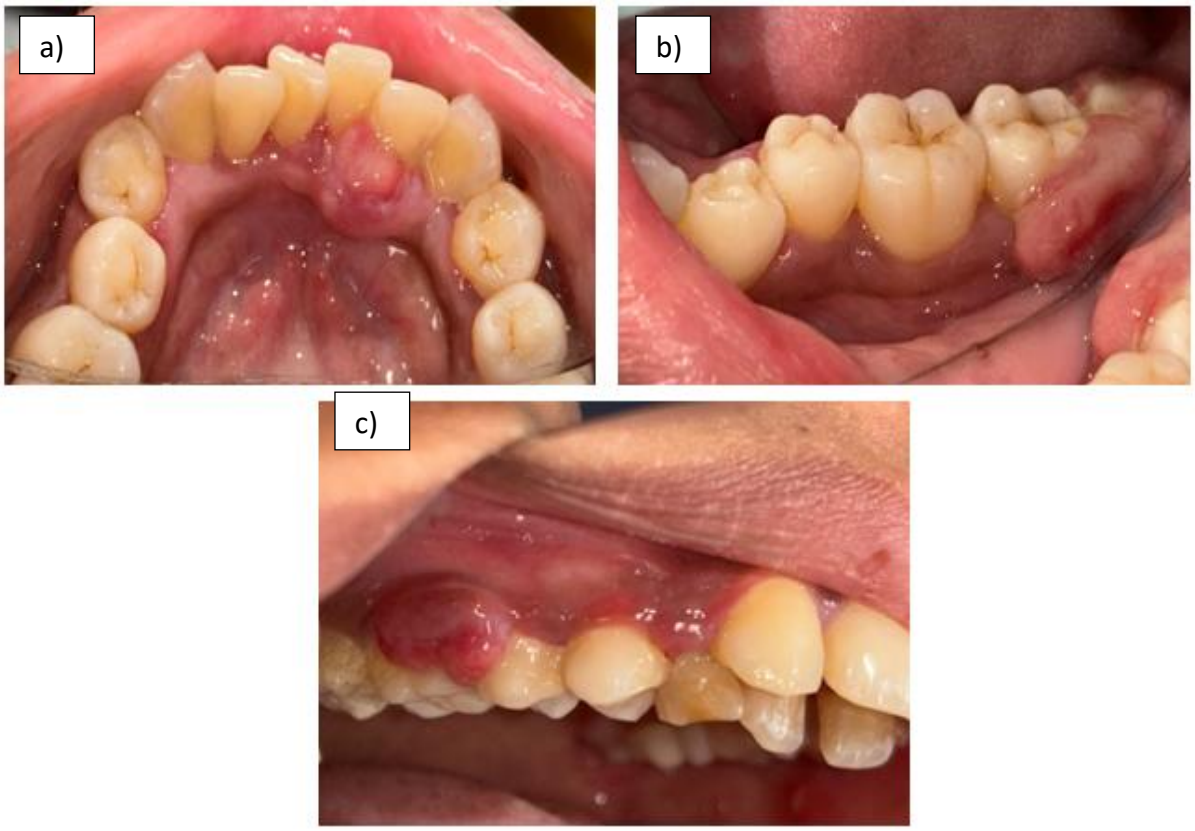

Fig. 1. Pre-Operative View Of Gingival Enlargement, a) Mandibular Anterior, b) second quadrant, c) fourth quadrant

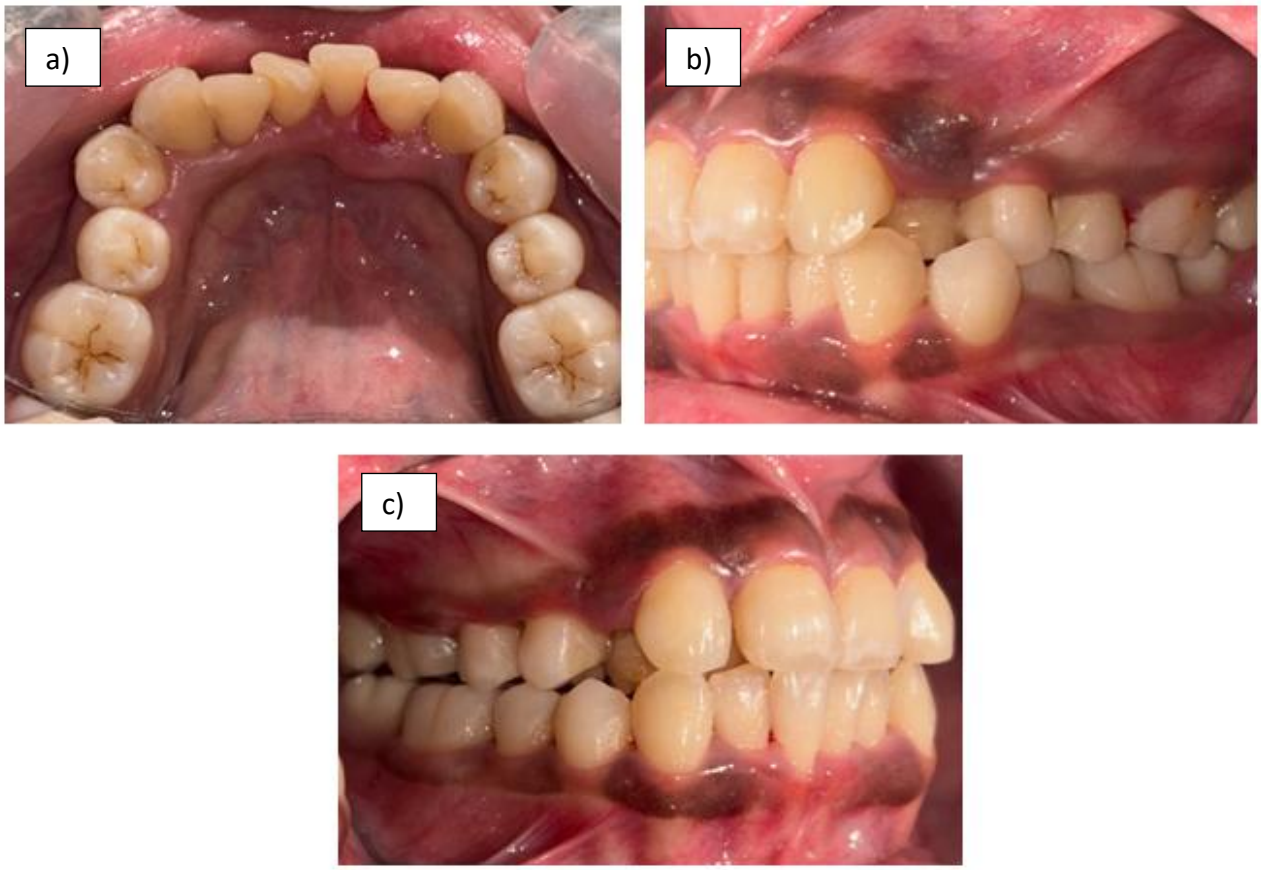

Fig. 2. Post-Operative View of Gingival Enlargement At 3 Week Follow Up Interval a) Mandibular Anterior, b) second quadrant, c) fourth quadrant

Chronic anaemia and iron overload in thalassemia patients are known to impair immune function and alter inflammatory pathways. Repeated blood transfusions lead to iron accumulation in various tissues, including periodontal tissues, which may enhance gingival inflammatory response through increased cytokine production. Akcalı et al. demonstrated elevated levels of inflammatory mediators such as IL-6, IL-8, sRANKL, and APRIL in gingival crevicular fluid, saliva, and serum of thalassemia major patients, suggesting a possible association between thalassemia and increased periodontal inflammatory activity[21,22]. These findings support the exaggerated gingival inflammatory response observed in the present case despite the enlargement being primarily plaque induced.

Iron overload has also been implicated in periodontal tissue alterations. Çalıskan et al. demonstrated iron accumulation within gingival tissues of thalassemia major patients and reported that periodontal tissues may be affected similarly to hepatic and endocrine tissues in transfusion-dependent patients[23,24]. Histopathological findings in their study showed increased fibrosis and collagen deposition in gingival tissues of thalassemia patients, indicating that chronic iron deposition may influence connective tissue metabolism and inflammatory response. These mechanisms may partially explain the diffuse gingival enlargement and persistent inflammatory changes observed in the present case[25].

The management of periodontal disease in patients with β-thalassemia major requires careful consideration of systemic health status, haematological parameters, and risk of infection or bleeding. In the present case, periodontal treatment was performed in consultation with the patient's physician, and appointments were scheduled immediately after blood transfusion to ensure optimal haemoglobin levels. Similar recommendations have been proposed in the literature, where invasive dental procedures are preferably carried out after transfusion therapy under antibiotic coverage when necessary[20]. Strict infection control measures and emergency haemostatic preparedness were maintained throughout treatment.

Non-surgical periodontal therapy consisting of oral hygiene reinforcement, full-mouth scaling and root planing, and chlorhexidine mouthrinse resulted in marked reduction in gingival inflammation and enlargement after 4 weeks. This finding highlights the central role of local etiological factors in the pathogenesis of gingival enlargement even in medically compromised patients. Improvement following phase I therapy suggests that the enlargement was largely inflammatory rather than purely fibrotic in nature. Similar regression of gingival enlargement following non-surgical therapy has been documented in previous reports involving thalassemia patients[20].

The present case further reinforces the importance of patient education and motivation in maintaining periodontal health. Use of a soft or baby toothbrush, reinforcement of atraumatic oral hygiene methods, and regular supportive periodontal therapy are essential in preventing recurrence. Since thalassemia patients are susceptible to chronic inflammation and infection, maintenance therapy assumes even greater significance.

Although this case demonstrated favourable short-term clinical outcomes, long-term follow-up is necessary because recurrent inflammation may occur if oral hygiene maintenance is inadequate. Furthermore, the limited literature regarding periodontal manifestations and management in β-thalassemia major highlights the need for additional clinical and longitudinal studies to better understand the relationship between iron overload, immune dysfunction, and periodontal disease progression.

SUMMARY AND CONCLUSION

β-thalassemia major is a hereditary hematologic disorder associated with chronic anaemia, repeated blood transfusions, iron overload, and altered immune responses that may adversely affect periodontal health. This case report describes the successful management of generalized inflammatory gingival enlargement in a patient with β-thalassemia major presenting with bleeding on brushing and poor oral hygiene. Following physician consultation and haematological evaluation, non-surgical periodontal therapy comprising oral hygiene reinforcement, full-mouth scaling and root planing, chlorhexidine mouthrinse, and supportive periodontal care was performed after blood transfusion sessions. Significant reduction in gingival enlargement, inflammation, and bleeding was observed during follow-up, with marked improvement in oral hygiene. The findings suggest that the enlargement was primarily plaque-induced, although systemic factors such as chronic anaemia and iron overload may have contributed to its severity.

This case highlights the importance of early diagnosis, meticulous plaque control, patient motivation, interdisciplinary collaboration, individualized treatment planning, and regular periodontal maintenance in achieving favorable periodontal outcomes and improving oral health–related quality of life in patients with β-thalassemia major.

ACKNOWLEDGEMENTS

The author would like to acknowledge the Department of Periodontology, Government Dental College and Hospital, Ahmedabad, for providing the foundational academic support, clinical guidance, and comprehensive resources necessary for the conceptualization and extensive synthesis of this review.

Declarations
Funding: None
Conflict of interest: None declared
Ethical approval: Not required

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