



The Problem of Excess: A Case Series on Gingival Enlargement

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Received: July 30, 2018; **Published:** August 24, 2018

Abstract

Background: Inflammatory gingival enlargement represents an abnormal overgrowth of gingiva in response to local irritants. The overzealous reaction to irritants manifests in inflammation and enlargement of gingiva causing functional disturbances and hinder oral hygiene maintenance. This case series reports 3 different ways of management of inflammatory gingival enlargement.

Methods: The treatment strategy depends upon tissue changes. It involves a Non-surgical and surgical approach. Non-surgical therapy involving scaling and root planing aims to remove local irritants and reverse the inflammatory changes. Splinting of mobile teeth helps in stabilizing dentition and providing optimum conditions for healing. When there is no significant reduction of enlargement, gingivectomy (External bevel or Internal bevel Gingivectomy) helps in restoring the gingival contours.

Results: Periodontal therapy aims to restore the health and function of the dentition. The systematic treatment approach resulted in uneventful healing and stable results which are easily maintained by the patients.

Conclusion: As Periodontal therapy is diagnosis- driven, thorough periodontal assessment helps in development of a rational treatment plan. This should include modification of risk factors which potentiates progression of plaque induced periodontal disease. The specific therapeutic endpoint includes establishment of gingival contours amenable to cleaning and health.

Keywords: Gingival Enlargement; Gingivectomy; Scaling and Root Planing; Chronic Irritation; Hyperplasia

Introduction

Gingival Enlargement (also known as Gingival hypertrophy or Gingival Hyperplasia) is an abnormal overgrowth of gingival tissues. It is a response by the host to various stimuli ranging from plaque induced, systemic, hormonal disturbances, blood dyscrasias, drug induced or genetic origin/predisposition [1].

Inflammatory gingival enlargement can be acute or chronic, the most common form being chronic. The degree and extent of enlargement cause increase in functional disturbances, acting as hindrance during oral hygiene performance. This further perpetuates the increase in plaque accumulation and the resultant chronic inflammatory response [2].

The underlying etiology and subsequent tissue changes manifested by them dictate the management strategies. The patient motivation, compliance and ability to perform adequate oral hygiene determine the success of treatment. The treatment involves a non-surgical phase involving Scaling and Root Planing and control of the etiologic factors. This result in reduction of tissue edema and infective cell infiltrate which reduces the size of enlargement. When significant fibrotic component is present, it will not respond to non-surgical therapy alone; surgical therapy is required to remove the excess tissue [2].

Case Description and Results

Case I

A 35 year old female, unmarried, saleswoman by occupation reported to department of Periodontology with a chief complaint of swelling and bleeding from gums. Being a saleswoman, the patient was concerned with the displeasing appearance because of the swelling. The swelling was noticed first 3 years back as small nodular enlargement in between the teeth which gradually increased to current size. As the swelling increased, the patient reported redness of gums and bleeding on eating and brushing teeth. Presently, the gums bleed spontaneously due to which patient has stopped brushing her teeth and uses mishri for cleaning her teeth as advised by her friend.

There was no significant medical, dental, or family history. The patient was reluctant to smile and would cover her mouth while talking or smiling. Intraoral examination revealed Grade 2 gingival enlargement [3]. Lips were incompetent. Maxillary left lateral incisor was palatally placed. The mandibular central and lateral incisors were grade II and grade I mobile respectively. Traumatic occlusion was present. The enlarged gingiva was reddish, nodular, soft and edematous, bled spontaneously.

A treatment plan consisting of initial periodontal therapy followed by gingivectomy procedure was formulated to improve aesthetics and function. The initial periodontal therapy comprising supragingival and subgingival scaling was performed. Occlusal adjustment was done to relieve traumatic occlusion. Oral hygiene instructions were given and the use of chlorhexidine mouthwash (0.2% Clohex™, Dr. Reddy's Laboratories Ltd., India) twice a day for one week was advised. The patient was advised to stop application of mishri and use a soft bristle toothbrush with fluoridated dentifrice using Bass brushing technique. The patient was recalled every week for 2 months. At this stage, radiographs were taken and complete blood count investigations were carried out. Splinting of lower anteriors was done using a fibre splint (Ribbond).

After two months, the gingival enlargement did not show considerable reduction in size, but the tissues appeared to be pink in colour and firm in consistency. Surgical therapy was decided upon to correct the anatomic disfigurement and render a self-cleansable contour to the gingiva.

Under local anaesthesia, the maxillary arch gingival enlargement was surgically excised using Internal bevel gingivectomy incision. Through debridement was done and flaps were closed using 3-0 mersilk sutures using interrupted suturing technique in interdental areas. The excised tissue was sent for histopathology examination. After one week, sutures were removed and oral hygiene instructions reinforced.

A similar procedure was done in the mandibular arch at different scheduled appointments. After 2 weeks, the patient was reviewed and healing was found to be satisfactory. The patient was advised to follow modified Bass technique for tooth-brushing. She was also prescribed an interdental brush (Thermoseal Proxa Brush - NS, IPCA) for cleaning the interdental areas.

The patient was kept under recall for 12 months for monitoring the oral hygiene efficiency and to note any signs of recurrence. The self-cleansable contours of the gingiva aided in maintenance of periodontal health and achieving excellent plaque control.

The patient was followed up for 1 year during which good oral hygiene and no recurrence of enlargement was noted. The patient would no longer cover her mouth and displayed improved confidence while talking or smiling (Figure 1 and 2).

Case II

A 30 year old female, who runs a beauty parlour, came with a complaint of swelling and bleeding from upper and lower anterior gums and mobile lower anterior teeth. She first noticed bleeding from gums 9 months back while toothbrushing. The gums became swollen and reddened and gradually increased in size to present size along with spontaneous bleeding. There were no relevant medical, dental or family history. The blood parameters were normal.

The intraoral examination revealed swelling on facial aspect of 21, 22 and 42, 41, 31, 32 region. Plaque and calculus were present and crowding was noticed wrt 11, 21. Grade II mobile 31, 41 and Grade I mobile 32, 42. Radiographic investigations revealed horizontal bone loss upto apical third in upper and lower anteriors.

The treatment plan included scaling and root planing and oral hygiene instructions. The patient was advised to use soft bristle toothbrush using Modified bass technique. The patient was reviewed every week for one month during which patient's compliance was noted and oral hygiene instructions reinforced. Occlusal adjustment was done and mandibular anterior teeth were splinted using fiber splint (Ribbond).

The swelling was markedly reduced 1 month following scaling and root planing and was kept on maintenance phase. After 1 year recall, the patient showed healthy gingiva and stable dentition and displayed satisfactory oral hygiene (Figure 3).

Case III

A 17 year old college going girl reported with complain of swelling and bleeding of gums in upper and lower anterior teeth region since 1 year. She noticed slight increase in gums around a year back. The swelling started in the interdental region as extensions of gums. It gradually progressed to involve the clinical crown and at present, covers almost the entire crown in lower teeth. No relevant medical, dental or family history was present.

On examining, Grade III enlargement (Bokenkamp) was noted. Crowding of lower Pseudo-pockets and inflamed gingiva compromised oral hygiene perpetuating the inflammation. Investigations including blood investigation, radiographic investigations did not reveal any significant findings.

Treatment plan comprised of scaling and root planing and oral hygiene instructions. She was advised to use soft bristle toothbrush and brush her tooth using modified-bass technique of toothbrushing. 0.12% Chlorhexidine mouthwash was prescribed for plaque control as it was difficult to maintain oral hygiene. After 1 month, inflammation was reduced but enlarged tissue persisted.

External bevel Gingivectomy procedure was performed to excise the excess tissue and maintain contours. 2 weeks after gingivectomy, good healing was noted and patient could maintain oral hygiene. She was referred to Orthodontics Department for further management. The oral hygiene maintenance was facilitated by improvement in alignment of teeth and correction of gingival contours (Figure 4).

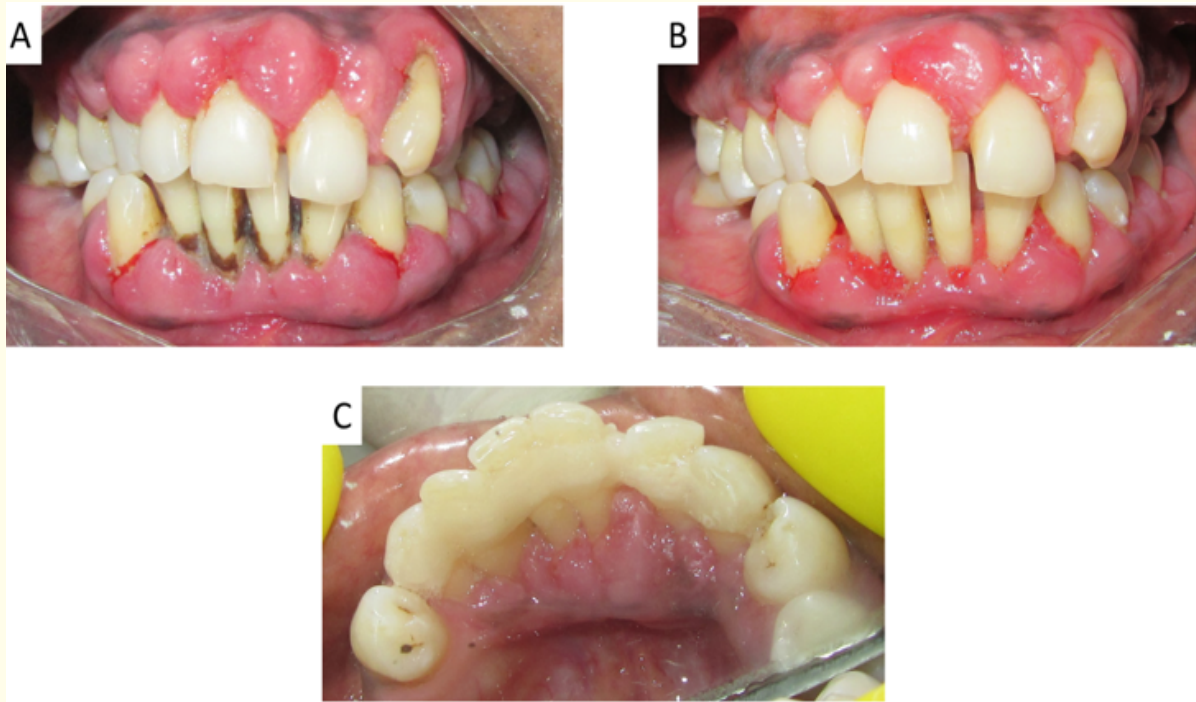


Figure 1A: Gingival Enlargement involving interdental papilla and marginal gingiva. Stillman's clefts between enlarged tissue in maxillary arch.

Figure 1B: 4 weeks post Scaling and root planing.

Figure 1C: Splinting of mandibular anteriors using Ribbond splint material.

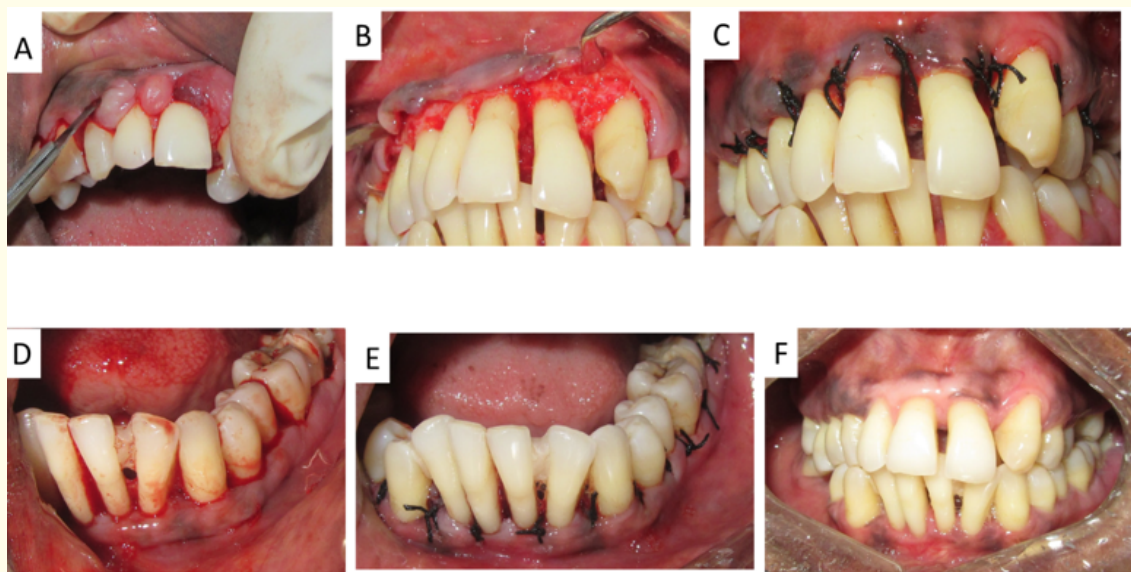


Figure 2A: Undisplaced flap procedure. Internal bevel gingivectomy incision.

Figure 2B: Full thickness mucoperiosteal flap elevation and thorough debridement of maxillary arch.

Figure 2C: Suturing of maxillary flaps with simple interrupted suture using 3-0 mersilk suture.

Figure 2D: Internal bevel gingivectomy and Debridement in mandibular arch.

Figure 2E: Suturing of mandibular flaps with simple interrupted suture using 3-0 mersilk suture.

Figure 2F: 1 year post-op. Note the stable periodontal health and well maintained oral hygiene.



Figure 3A: Diffuse gingival enlargement with unilateral biting habit.

Figure 3B: One week post Scaling and Root Planing.

Figure 3C: Splinting of mandibular anteriors using Ribbond splint material.

Figure 3D: 1 year post scaling. Note the stable dentition and well maintained oral hygiene of the patient. Complete resolution of inflammation.

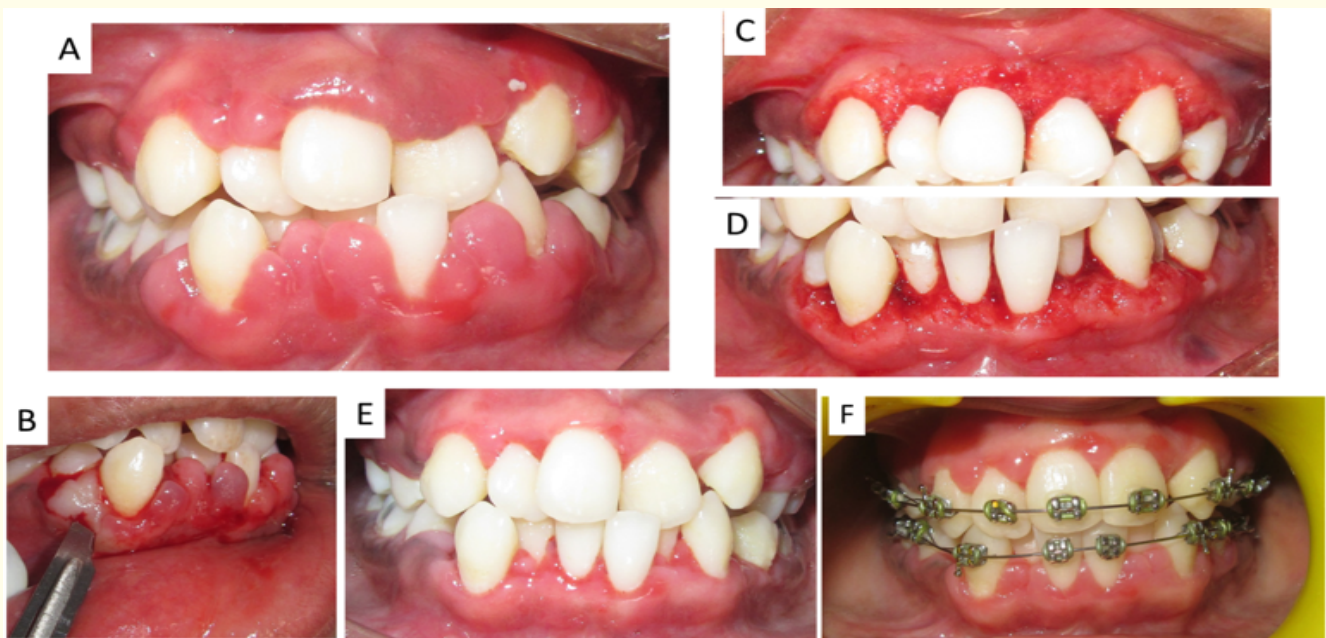


Figure 4A: Diffuse fibrous gingival enlargement covering almost entire crown.

Figure 4B: External Bevel incision using No.15 blade. Gingivectomy performed to excise the enlarged tissue

Figure 4C: Maxillary arch gingivectomy.

Figure 4D: Mandibular arch gingivectomy.

Figure 4E: 1 month Post op.

Figure 4F: Orthodontic alignment of teeth.

Discussion

Gingival overgrowth varies from mild enlargement involving an isolated interdental papilla to segmental or uniform and marked enlargement affecting one or both the jaws having diverse etiopathogenesis [4]. In the initial stages, gingival enlargement appears as a localized nodular enlargement of the interdental papilla (horizontal growth) and with further progression extends to the dental crown (vertical growth). In severe cases, the enlarged gingival tissue may cover a large portion of the clinical crown [5].

In initial stages, the increased susceptibility of the interdental papilla to nodular enlargement compared with marginal gingiva or other parts of the gingiva can be explained by differences in the molecular composition of different parts [6]. The cells in the interdental papilla are in an activated state and/or inherently display a specific phenotype similar to wound healing.

Gingival enlargements are commonly associated with long-standing bacterial plaque accumulation. Oral inflammatory hyperplastic lesions represent an over-exuberant reparative response of tissue to injury [7]. Calculus, overhanging margin of restorations, foreign bodies, margin of caries, sharp spicules of bone and overextended borders of appliances are the possible sources of traumatic irritants [8]. These irritants stimulate the formation of granulation tissue that consists of proliferating endothelial cells, chronic inflammatory cells and few fibroblasts [9]. Hormonal changes during menstruation may also be one of the causes of exuberant proliferation of the gingiva [10]. In present cases, local irritants (plaque and calculi) may be considered as primary etiologic factor.

Management of such inflammatory enlargements involve removal of irritants and maintenance of oral hygiene by the patient. As the recurring insult is eliminated, inflammation subsides, vascularity is reduced and the lesion shrinks markedly. The decrease in the size of the lesion is directly proportional to the amount of inflammation present. If the lesion is composed mostly of fibrous tissue, there is little shrinkage, but if considerable granulation tissue and inflammation exist, there is marked shrinkage [2]. Regular professional oral prophylaxis and good patient compliance are required in the management of such cases.

Non-surgical periodontal therapy, without systemic or local adjunct antimicrobial therapy, results in a significant improvement in periodontal parameters viz. Bleeding on Probing (BOP), Probing Depth (PD). The circulating levels of inflammatory markers (viz. C-Reactive Protein, fibrinogen, and WBC counts) are significantly reduced following mechanical therapy [11].

When chronic inflammatory gingival enlargements include a significant fibrotic component which does not resolve completely after initial periodontal therapy or does not meet the aesthetic and functional demands of the patient, surgical removal is the treatment of choice. The most widely employed surgical approaches for the treatment of gingival enlargements is gingivectomy or the modified flap technique [1].

Patient susceptibility to gingival enlargement is variable and seems to be affected by the degree of gingival inflammation present. The exact mechanism of this response is not known.

Gingival connective tissue metabolism is largely controlled by chemokines and cytokines secreted by inflammatory cells such as macrophages and lymphocytes and, to a lesser degree, by fibroblasts [12-15]. Cytokines regulate a wide range of essential cellular processes such as fibroblast growth, non-collagenous matrix synthesis, and proliferation of ECM proteins in gingival connective tissues [16,17]. These processes are relevant to the molecular mechanism of gingival enlargement [18]. Several studies highlighted that elevated levels of various cytokines including tumor-necrotizing factor- α (TNF- α), interleukin-1b (IL-1b), transforming growth factor-b (TGF-b), connective tissue growth factor (CTGF), and platelet-derived growth factor (PDGF) might contribute to the pathogenesis of gingival enlargement [19,20].

McGaw and colleagues [21] in ultrastructure stereologic studies stated that plaque-associated gingival inflammation increases fibroblast synthetic activity. Enlargements represent disorders of the fibrous connective tissue layer of the oral mucosa, which proliferates due to continuous stimulation and chronic irritation [22]. These lesions are hyperplastic in nature, not neoplastic [23]. Enlargement may result due to increase in number of gingival fibroblasts [24] or slower than normal growth. There appears to be increased collagen synthesis rather than decreased levels of collagenase activity responsible for enlargement [25].

As a preventive measure, chlorhexidine 0.12 once a day has been recommended for patients at risk for gingivitis [26]. Occlusal trauma and dental mobility cause the aggravation of periodontal lesions. The therapy by means of occlusal adjustment and splinting improves the prognosis of teeth affected by periodontal disease [27].

Histologically, inflammatory fibrous hyperplasia is made up of a mass of hyperplastic connective tissue with dilated blood vessels, usually with chronic inflammatory cells such as lymphocytes and plasma cells. Fibrous hyperplasia may present with a solid connective tissue with minimum to no inflammatory cells. The surface epithelium ranges from normal to acanthotic, ulcerated, keratotic or a combination of two or more of these features [28].

The presence of enlargement further compromises the maintenance of adequate oral hygiene. This reflects the importance of patient education, motivation and compliance during and after periodontal treatment. Reinforcement of effective oral hygiene is essential, since patients have a tendency to revert to their original behaviour. The patient must be placed into a maintenance schedule to preserve a healthy dentition.

Patients with gingival enlargement face unique challenges while brushing. A vibratory tooth brushing technique like the Bass method should be recommended to gingival enlargement patients. Brushing technique must be demonstrated to the patient on a model or patient's own teeth. Careful instructions of placement of bristles, pressure, vibration of brush should be given depending on the amount of enlargement present. In severe enlargement cases, extra soft bristle brushes are used to adapt carefully to the morphology of tooth inside the grooves formed in enlarged gingiva. Power toothbrushes (electric or sonic) are highly effective in removing interproximal plaque. Oral irrigation devices are effective for debris removal for those finding difficult to clean inside the grooves between enlarged tissue. Other methods of plaque control include flossing, use of interdental brush or gingival stimulators [29].

Conclusion

It was noticed in all 3 cases, that once the enlargement was removed/subsided and oral hygiene instructions were reinforced, the patient was able to maintain good oral hygiene.

A patient centred approach is required while determining the end point of periodontal treatment. In advanced cases of bone loss, instead of heroic attempts to rehabilitate the dentition, adequate periodontal therapy and supportive therapy will enhance the quality of life and maintain dentition in health and function [30].

Conflict of Interest

There are no conflicts of interest.

Bibliography

- Jadhav T, et al. "Chronic Inflammatory Gingival Enlargement Associated with Orthodontic Therapy- A Case Report". *The Journal of Dental Hygiene* 87.1 (2013): 19-23.
- Carranza FA and Hogan EL. "Gingival enlargement". In: Newman MG, Takei HH, Klokkevold PR, Carranza FA. "Carranza's Clinical Periodontology". 11th edition. Philadelphia, Penn: W.B. Saunders Company (2006): 373-390.
- Bokenkamp A, et al. "Nifedipine aggravates cyclosporin A-induced hyperplasia". *Pediatric Nephrology* 8.2 (1994): 181.
- Tiwana PS, et al. "Facial distortion secondary to idiopathic gingival hyperplasia: surgical management and oral reconstruction with endosseous implants". *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology* 100.2 (2005): 153-157.
- Miranda J, et al. "Reliability of two measurement indices for gingival enlargement". *Journal of Periodontal Research* 47.6 (2012): 776-782.
- Csiszar A, et al. "Distinctive molecular composition of human gingival interdental papilla". *Journal of Periodontology* 78.2 (2007): 304-314.
- Priddy RW. "Inflammatory hyperplasias of the oral mucosa". *Journal of the Canadian Dental Association* 58.4 (1992): 311-321.
- Wood NK and Goaz PW. "Differential Diagnosis of Oral and Maxillofacial Lesions". 5th edition. St Louis: Mosby (1997): 130-161.
- Page RC and Schroeder HE. "Pathogenesis of inflammatory periodontal disease. A summary of current work". *Laboratory Investigation* 34.3 (1976): 235-249.
- Mascarenhas P, et al. "Influence of sex hormones on the periodontium". *Journal of Clinical Periodontology* 30.8 (2003): 671-681.
- Syed Akhtar Hussain Bokhari, et al. "Non-Surgical Periodontal Therapy Lowers Serum Inflammatory Markers: A Pilot Study". *Journal of Periodontology* 80.10 (2009): 1574-1580.
- McKevitt KM and Irwin CR. "Phenotypic differences in growth, matrix synthesis and response to nifedipine between fibroblasts derived from clinically healthy and overgrown gingival tissue". *Journal of Oral Pathology and Medicine* 24.2 (1995): 66-71.
- Seymour RA, et al. "The pathogenesis of drug-induced gingival overgrowth". *Journal of Clinical Periodontology* 23 (1996): 165-175.
- Kuru L, et al. "Expression of growth factors in the gingival crevice fluid of patients with phenytoin-induced gingival enlargement". *Archives of Oral Biology* 49.11 (2004): 945-950.
- Soga Y, et al. "CYP2C polymorphisms, phenytoin metabolism and gingival overgrowth in epileptic subjects". *Life Sciences* 74.7 (2004): 827-834.

16. Dahllof G., et al. "Proteoglycans and glycosaminoglycans in phenytoin induced gingival overgrowth". *Journal of Periodontal Research* 21.1 (1986): 13-21.
17. Kiritsy CP, et al. "Role of growth factors in cutaneous wound healing: a review". *Critical Reviews in Oral Biology and Medicine* 4.5 (1993): 729-760.
18. Modeer T, et al. "Phenytoin potentiates interleukin-1 induced prostaglandin biosynthesis in human gingival fibroblasts". *British Journal of Pharmacology* 106.3 (1992): 574-578.
19. Dill RE., et al. "Phenytoin increases gene expression for platelet derived growth factor B chain in macrophages and monocytes". *Journal of Periodontology* 64.3 (1993): 169-173.
20. Uzel MI, et al. "Connective tissue growth factor in drug induced gingival overgrowth". *Journal of Periodontology* 72.7 (2001): 921-931.
21. McGaw WT and Ten Cate AR. "A role for collagen phagocytosis by fibroblasts in scar remodelling: An ultrastructural stereologic study". *Journal of Investigative Dermatology* 81.4 (1983): 375-378.
22. Regezi JA and Sciubba JJ. "Oral Pathology: Clinical-Pathologic Correlation". Philadelphia: Saunders (2008): 156-159.
23. Shadman N., et al. "Peripheral giant cell granuloma: A review of 123 cases". *Dental Research Journal* 6.1 (2009): 47-50.
24. Shirasuna K, et al. "Abnormal cellular property of fibroblasts from congenital gingival fibromatosis". *Journal of Oral Pathology* 17.8 (1988): 381-385.
25. Tipton DA, et al. "Increased proliferation, collagen, and fibronectin production by hereditary gingival fibromatosis fibroblasts". *Journal of Periodontology* 68.6 (1997): 524-530.
26. Pundir AJ, et al. "Treatment of drug-induced gingival overgrowth by full-mouth disinfection: A non-surgical approach". *Journal of Indian Society of Periodontology* 18.3 (2014): 311-315.
27. Forabosco A, et al. "The importance of splinting of teeth in the therapy of periodontitis". *Minerva Stomatologica* 55.3 (2006): 87-97.
28. Greenberg MS and Glick M. "Burket's oral medicine: Diagnosis and treatment". 10th edition. Hamilton, Ontario: BC Denker (2003): 138-139.
29. Thompson AL, et al. "Treating patients with drug-induced gingival overgrowth". *Journal of Dental Hygiene* 78.4 (2004): 12.
30. Shah EB, et al. "Patient Centered Outcomes in Periodontal Treatment-An Evidenced Based Approach". *Journal of Clinical and Diagnostic Research: JCDR* 11.4 (2017): ZE05-ZE07.

Volume 2 Issue 9 September 2018

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