Case Report

Oral Contraceptives Induced Gingival Overgrowth - A Clinical Case Report

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Received Date: June 28, 2017 **Accepted Date:** July 13, 2017 **Published Date:** July 28, 2017

Citation: Anushi Mahajan, Ritesh Sood (2017). Case Report: Oral Contraceptives Induced Gingival Overgrowth- A Clinical Case Report. POJ Dent Oral Care 1(1): 1-5.

Abstract

Aim: The purpose of this article is to report a case of drug induced gingival enlargement due to oral contraceptives, managed by nonsurgical periodontal therapy.

Background: Drug-induced gingival overgrowth remains the most widespread unwanted effect of systemic medication on the periodontal tissues. Hormones are specific regulatory molecules that modulate a host of body functions. Oral contraceptives that contain estrogen and/or progesterone are associated with gingival enlargement.

Report: A 32-year-old female presented with a complaint of swelling of the gingiva with spontaneous bleeding in the mandibular anterior region for a period of two years. The health history documented the use of contraceptives for two years, and a clinical examination revealed the existence of poor oral hygiene and enlarged painful gingival tissues that bled when touched.

Summary: Females on oral contraceptives can be considered as a "risk group" for periodontal diseases. Not all females on oral contraceptives respond in similar way. Plaque control is the most important procedure in periodontal therapy. Although the initial picture presented the possibility of surgical intervention, the clinical problems were resolved with non-surgical treatment. Another factor contributing to response to therapy is patient compliance. The patient followed home care instructions well and was effective in personal oral hygiene measures.

Keywords: Gingival enlargement, Sex hormones, Oral contraceptives.

Introduction

An increase in life expectancy is attributed to an expansion in our understanding of disease process and the subsequent explosion in drug treatments. Some of these drugs will have an impact on the periodontium and its response to bacterial plaque which can be categorized as follows:

- an adverse effect on the periodontal tissues
- affording some degree of protection against periodontal breakdown
- causing an increased risk of periodontal breakdown

What cannot be ignored, are the adverse effects of these medications on periodontium. Drug-induced gingival overgrowth remains the most widespread unwanted effect of systemic medication on the periodontal tissues.

Gingival enlargement represents an over-exuberant response to a variety of local and systemic conditions [1]. Gingival enlargement produces aesthetic changes and clinical symptoms including pain, bleeding, speech disturbances, abnormal tooth movement, occlusion problems, problems in mastication, enhancement of caries development and periodontal problems.

The commonest drugs known to cause gingival enlargement include anti-convulsions, calcium-channel blockers,

immunosuppressant (Cyclosporine), antifungal (Ketoconazole), antibiotics (Erythromycin) [2], Oral contraceptive drugs. They are currently 20 prescriptions known to cause gingival enlargement.

Oral contraceptives have become a very widely used form of birth control during the past two decades. These drugs include the use of gestational hormones at a concentration to mimic pregnancy to prevent ovulation. All oral contraceptives act by artificially altering sex hormone levels, their influence on gingival inflammation has been studied.

This paper presents an unusual case report of oral contraceptives induced gingival enlargement.

Case Report

A 32-yr old female was referred to dept. of Periodontology & Oral Implantology. The patient reported with a chief complaint of spontaneous bleeding from gums, swollen gums and sensitivity to hot & cold since 2 yrs.

This was patient's first dental visit. The patient had no systemic problems that could have contributed to gingival enlargement. A detailed family history taken was non-contributory.

Drug history revealed that patient was not any medications like anticonvulsants, calcium-channel blockers, immunosuppressants

etc. which could have contributed to the enlargement. However, patient revealed that she was on oral-contraceptives for past 2 years.

Patient was on Mala-D contraceptive (A combination hormonal contraceptive. Each film coated white coloured tablet contains levonorgestrel-0.15 mg & ethinyloestradiol-0.03mg. Each brown coloured film coated tablet contains ferrous fumarate 60mg equivalent to ferrous iron 19.5mg) The patient took a 21-tablet packet monthly, one tablet each day for 21 days and none for the next seven days. Patient observed gingival bleeding within a month of starting oral contraceptive which soon was followed by enlargement of gingiva.

A complete gingival examination was done. Spontaneous gingival bleeding occurred on slight provocation (Figure 1).

Figure 1: Initial examination; Spontaneous gingival bleeding on slight provocation.

A diffuse gingival enlargement covering most of the mandibular anterior segment involving the interdental, marginal & attached gingiva was seen. The gingiva appeared bright red, friable, and edematous with a shiny surface (Figure 2).

Figure 2: A diffuse gingival enlargement covering most of the anterior segment. The gingiva appeared bright red, friable, and edematous with a shiny surface.

The left lower lateral incisor was (Grade-2) mobile. The lower central incisors also showed Grade-1 mobility. Attachment loss of ≥ 5 mm was seen in relation to lower anteriors.

The laboratory investigations were within normal limits. Panoramic view showed a combination of vertical and horizontal bone loss (Figure 3). No histological examination or excisional biopsy was carried as

patient was responding well to oral hygiene measures.

Figure 3: Panoramic view showing inconsistent bone loss.

Diagnosis

All inflammatory & non-inflammatory causes of gingival enlargement were excluded. A negative family history discarded the genetic origin. Epulis and pyogenic granuloma were ruled out as they are localized enlargements. Leukemic gingival enlargement was ruled out as the complete blood hemogram failed to indicate any abnormalities.

Based on the clinical picture, the case history and patient's response to the treatment, a provisional diagnosis of gingival enlargement due to oral contraceptive was made.

Treatment

Patient was asked to discontinue the oral contraceptives. Patient was given complete oral hygiene instructions. A thorough Phase-1 therapy comprising of scaling, root planing and curettage was done. Patient was advised to perform warm saline rinses 4-5 times/ day and was put on 0.02% chlorhexidine mouthwashes. Patient was maintained on regular follow-up visits where-in brushing technique was evaluated and oral hygiene measures were re-inforced.

Two months of ensuing of periodontal treatment and stoppage of oral contraceptive, a marked reduction in the inflammatory component of gingival enlargement was seen (Figures 4:A and 4:B).

Figure 4:A. Two months After Phase 1 Therapy & discontinuation of OCP.

Figure 4.B. Two months after Phase 1 Therapy and discontinuation of OCP

The gingiva appeared healthier. There was significant reduction in size of gingiva and appeared firm in consistency when compared to the initial visit (Figure 5).

Figure 5: Lingual view. Reduction in gingival enlargement.

Patient revealed that she no longer experienced discomfort while brushing or sensitivity to hot and cold.

Patient is advised to come for follow-up every 3 months for a period of one-year.

Discussion

Systemic medications are the most common causes of gingival enlargement. Phenytoin, Cyclosporine and Nifedipine have been shown to cause disfiguring enlargement of the gingiva. Oral contraceptives have also been shown to cause gingival enlargement [3-6].

A relationship between altered levels of sex hormones and variations in degree of gingival inflammation has been seen in various studies. An increased gingival inflammation in females during pregnancy is seen [5,7]. The rise in inflammation closely paralleled an increase in the blood level of the hormones estrogen and progesterone seen during pregnancy [8]. It was hypothesized that the aggravation of gingivitis seen during pregnancy was caused primarily by an elevated level of progesterone and its effect on the microvascular system. Since

the gingival inflammation and the hormone levels subsided following parturition, it was suggested that altered levels of estrogen and progesterone may influence the inflammatory state. Females taking oral contraceptives revealed states of gingival inflammation very similar to pregnant individuals [6].

Gingival inflammatory indices are higher for individuals on oral contraceptives than in subjects not taking such medication due to artificially elevated levels of progesterone.

Gingival changes are related to the stimulation of specific populations of fibroblasts by estrogen, increased vascular permeability and proliferation [9]. Both the sex hormones decrease gingival immune response to plaque bacteria [10]. Inflamed gingival tissues are capable of metabolizing sex hormones to active metabolites at higher rate, thus, local irritants may exaggerate oral contraceptive-induced gingival changes. Therefore, the response of the periodontium in Oral contraceptive induced gingival overgrowth is probably multifactorial in nature where dose, duration of pill usage, dental plaque and sex hormone-sensitive cells are the key modifying factors.

In gingival tissues, estrogen is responsible for keratinization and proliferative changes in epithelium and increased fibroblastic activity [9].

Progesterone increases proliferation, dilatation, tortuosity and permeability of gingival microvasculatures, facilitates bone resorption, decreases collagen production; thus promoting tissue catabolism and delaying repair [9,11].

Hence, estrogen and especially progesterone in Oral contraceptives can contribute to periodontal changes similar to pregnancy [12].

Oral contraceptive agents most commonly used nowadays contain low doses of estrogens (30µg/day) and/or Progestins (1.5mg/day) [7]. In this case report although the dosage taken by the patient was low but it was a combination of both estrogen & progesterone than individual hormones alone, which probably resulted in overgrowth. The relative effects of contraceptive pill and injections on gingival inflammation have been noted. Irrespective of the type of preparation the usage of hormonal contraceptives for 2-4 years resulted in significant increase in periodontal breakdown [8]. Currently available oral contraceptive agents might influence the periodontal condition of women taking these medications for at least 12 months continuously, regardless of age and amount of plaque accumulation, resulting in increased pocket depth and sulcus bleeding index and a slight tendency to develop loss of attachment [13,14].

The effect of oral contraceptive on microvasculature is based on the alteration of calcium influx, release of neurotransmitters and histamine release [9].

Addition of sex hormones to gingival tissue caused a significant increase in the synthesis of prostaglandin E₂ [15]. Since E-type prostaglandins are potent mediators of inflammation, explanation of the mechanism by which sex hormones increase inflammation may be possible.

The greatest effect of the oral contraceptive on the gingiva was seen during the first three months of intake. During the subsequent three months there was a further less marked effect. Gingival exudate increased only during the first six months of intake of a combination type of pill. The gingival score tended to decrease after nine months of pill intake, so that the score of those taking the pill for one or two years was more or less similar to those using it for only three months. Interestingly, there was no significant difference in gingival score between those taking the pill for one or two years [3].

This is in agreement with the finding that gingival exudate did not increase in those who had been taking medication for one year prior to the examination period [3].

An episode of hyperplastic gingivitis was related to ingestion of oral contraceptives [4,5]. Thus, a persistent accumulation of bacterial plaque at the gingival margin capable of causing a low grade inflammation for female not taking oral contraceptives could produce an exaggerated response if the individual were artificially increasing systemic progesterone levels by taking oral contraceptives.

Estrogens alter the degree of polymerization of ground substance by increasing epithelial glycogen. Because of the vascular changes caused by these hormones, there is more florid response to the irritant effects of plaque (Manson 1986). Variations in gingival condition cannot be accounted for by differences in the amount of local irritants. The mechanism by which gestagens affect the gingiva is obscure, although lowering tissue threshold to local irritants seems plausible.

The important difference is that while hormone alteration is over in a maximum of 9 months with the pregnant individuals; individuals taking oral contraceptives may be altering their hormone levels for much longer periods of time.

Peri-endothelial and tissue mast cells are occasionally disrupted in response to topical application of female sex hormones is pertinent [3]. Other investigators have also reported disruption of mast cells in response to female sex hormones.

Gestagens may exert their effect through disruption of gingival mast cells, liberating their content of histamine and proteolytic enzymes and thus aggravating gingival inflammation produced by local irritants. One might further speculate that most of the mast cell stores will be released during the first six months of hormonal intake, thus accounting for partial amelioration of the gingival condition after nine months. A histochemical study of gingival mast cells in women on oral contraceptive therapy is necessary to test this hypothesis. It is speculated that gestagens may exaggerate gingival response to local irritants by disrupting gingival mast cells.

Oral contraceptive users and pregnant women have shown an increase in the prevalence of specific bacterial species. In particular there was a 16-fold increase in the population of *Bacteroides melaninogenicus* subspecies *melaninogenicus* and *intermedius*, isolated from plaque obtained from hormonal contraceptive users. This is due to competition for binding between progesterone and naphthaquinone, which have a

structural similarity and latter is an essential nutrient for the microbe [15].

The resultant gingivitis in oral contraceptive users can be minimized by establishing low plaque levels during or at the beginning of the therapy [8]. In our patient, optimal oral hygiene was not observed as it was first dental visit of the patient. This may have been the reason for the initiation of gingivitis after oral contraceptives were started.

It is generally accepted once the patient discontinues the oral contraceptive the gingival condition will be reversed. The inflammatory component of gingival enlargement was removed after phase-I therapy but the fibrous component persisted even after discontinuation of the contraceptive. This can be attributed to the fact that hormonal changes induced by oral contraceptives alter collagen metabolism and these changes are not immediately reversible after discontinuation of their use. In one study the levels of sex hormone binding globulin remained elevated for up to one year in oral contraceptive users [16].

Summary

Proper diagnosis, professional intervention, and patient compliance have resulted in the remission of the gingival disease.

Plaque control is the most important procedure in periodontal therapy. Although the initial picture presented the possibility of surgical intervention, the clinical problems were resolved with non-surgical treatment.

Clinical significance

Females on oral contraceptives can be considered as a "risk group" for periodontal diseases. Not all females on oral contraceptives respond in similar way. The incidence & prevalence of drug-induced gingival enlargement due to oral contraceptives is not known so far. More studies need to be carried out in this regard.

This case reaffirms that a combination pill, consisting of low doses of hormones is more prone to cause gingival enlargement than individual hormones used alone.

Also, adequate plaque control and maintenance of proper oral hygiene is indispensable in management of drug-induced gingival enlargement due to oral contraceptives.

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