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# Non-surgical management of inflammatory gingival enlargement associated with malocclusion, mouth breathing and incompetent lips: A case report

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**Abstract**
Here we report a case of management of inflammatory gingival enlargement associated with malocclusion, mouth breathing and incompetent lips in a non-surgical way. An 18 years old female reported to the department of periodontology complaining of gingival bleeding and enlargement. This case report highlights the need for an interdisciplinary approach in the diagnosis and treatment of such cases.

**Keywords:** Calculus, malocclusion, mouth breathing, inflammatory gingival enlargement

## Introduction
Gingival enlargement is a multifactorial condition that develops in response to various stimuli and interactions between environment and host [1]. It is an abnormal proliferation of gingival tissues caused by underlying inflammation. Inflammatory enlargement can be classified as acute or chronic, localized or generalized. It may involve interdental papilla, marginal papilla or attached gingiva [2]. Most commonly gingival enlargements are plaque-induced mostly affecting the interdental papillae. Plaque induced gingival enlargements can be managed with non-surgical therapy that is supragingival and subgingival debridement of the plaque and calculus [3]. The common causative factors of gingival enlargement may be plaque, calculus, malocclusions, hormonal imbalances [4].
Malocclusion can be defined as the abnormal teeth alignment or the loss of association between the upper and the lower arches [5]. Malocclusions occur in all age groups causing trauma to the gingiva and other oral structures [6]. One type of malocclusions causing inflammatory gingival enlargement in a pre-existing gingival inflammation is deep bite. Deep bite is a malocclusion in which the mandibular incisor crowns are excessively overlapped vertically by the maxillary incisors when the teeth are in centric relation [7] Traumatic deep bite can exert forces which increases inflammation and cause damage to the periodontal tissues in patients with poor oral health.
Mouth breathing is the habitual respiration through the mouth instead of nose. It can be habitual, obstructive or anatomical. Studies suggest that mouth breathing can increase the susceptibility of gingival inflammation irritating the gingiva due to dryness and surface dehydration which ultimately aggravates the existing gingivitis. Mouth breathing may result in decreased effects of cleansing mechanism of saliva increasing the prevalence of gingival inflammation in mouth breathers. Gingival inflammation associated to mouth breathing may be a result of bacterial plaque deposits [9]. Mouth breathing is often associated with recurrent throat infections, nasal blockade, deviated nasal septum or adenoids [10].

## Case Presentation
An 18-year old female patient came to the department of periodontology with complains of bleeding gums and deposits on teeth present since 8 months. The patient was apparently alright 8 months back then she started noticing deposits on her teeth and gingival bleeding. Her complete blood count was within the normal range except for the reduced platelet count and haemoglobin and increased total leukocyte count [Table 1].

Her Random blood sugar level was within the normal range [Table 3]. An intraoral examination revealed the presence of supra and subgingival plaque and calculus on probing. [Figure 1] Gingival enlargement was seen on interdental papilla and attached gingiva. [Figure 1] Bleeding on probing was present in maxillary and mandibular anterior region.

**Fig 1:** Intraoral clinical photograph showing gingival enlargement and deposits in both arches

**Fig 2:** Intraoral clinical photograph showing gingival status after supragingival scaling

**Fig 3:** Follow up Intraoral clinical photograph after 2 months of supragingival and subgingival scaling

**Fig 4:** Follow up Intraoral clinical photograph after 3 months of supragingival and subgingival scaling

**Table 1:** Complete blood count was within the normal range except for the reduced platelet count and haemoglobin and increased total leukocyte count

| Complete Blood Count | Result | Normal Range |
|---|---|---|
| Haemoglobin (Hb) | 11.1 g/dl | 12-15 |
| RBC Count | 4.01 10^12/L | 4.5-5.5 |
| Haematocrit (HCT) | 32.9% | 40-50 |
| MCV | 82 fl | 81-101 |
| MCH | 27.8 pg | 27-32 |
| MCHC | 33.9 g/dl | 32.5-34.5 |
| RDW-CV | 14.0% | 11.6-14.0 |
| Platelet count (PLT) | 395 10^9/L | 150-410 |
| Total WBC count | 10.8 10^9/L | 4.0-10.0 |
| Neutrophils | 63.5% | 40-70 |
| Absolute Neutrophils Count | 6.86 10^9/L | 2.0-7.0 |
| Lymphocytes | 28.0% | 20-40 |
| Absolute Lymphocyte Count | 3.02 10^9/L | 1.0-6.2 |
| Monocytes | 6.8% | 2-10 |
| Absolute Monocyte Count | 0.73 10^9/L | 0.2-1.0 |
| Eosinophils | 1.5% | 1-6 |
| Absolute Eosinophil Count | 0.16 10^9/L | 0.02-0.5 |
| Basophils | 0.2% | 1-2 |
| Absolute Basophil Count | 0.0 | 0.0-0.3 |

**Table 2:** Complete blood count and Haemogram

| Morphology | |
|---|---|
| WBC | There is mild leucocytosis |
| RBC | Normocytic normochromic RBCs |
| Platelets | Adequate |

**Table 3:** Blood Sugar Test

| Glucose Random (RBS) | | |
|---|---|---|
| **Investigation** | **Results** | **Normal range** |
| Glucose Random (RBS) | 75.1 mg/dl | 70-140 |

**Fig 5:** Orthopantomogram showing normal bone level with partially formed mandibular 3rd molars

Based on clinical examination, history taking and various investigations the patient was diagnosed as Inflammatory gingival enlargement associated with mouth breathing, deep bite and incompetent lips. The patient was educated about the harmful effects of poor oral hygiene. She was motivated and demonstrated the brushing technique {Charters method}. First appointment for supragingival scaling was done. She underwent non-surgical periodontal therapy involving supragingival and subgingival scaling in multiple appointments. She was prescribed topical antiseptic gel {Metronidazole and Hexidine} for gingival massage for two weeks and anti-inflammatory drugs for 3 days.

As the patient had a habit of mouth breathing, consultation from an ear, nose and throat (ENT) specialist or otorhinolaryngologist was sought to rule out airway blockage

before prescribing a habit-breaking appliance. During clinical examination and in X-ray nasopharynx lateral view, inferior nasal hypertrophy was noticed. She had been advised steam inhalation, tablet montelukast and nasal drops (consisting of xylometazoline) and the patient was kept on recall follow-up evaluations.

Figure 3 shows Intraoral clinical photograph of follow up after 2 months of supragingival and subgingival scaling. Figure 4 shows Intraoral clinical photograph of follow up after 3 months of supragingival and subgingival scaling.

## Case Discussion

The early manifestation of mouth-breathing induced gingival enlargements, redness of the labial margin and interdental gingiva [11].

A similar case suggested close association between gingival enlargement and mouth breathing in a 13 years old male patient's maxillary and mandibular arches [12]. A comprehensive review literature stated the occurrence of inflammatory gingival enlargement on the labial aspects of the mandibular anteriors [13]. Similarly, the present case also shows Grade III gingival enlargement on the labial aspect of the mandibular anteriors which was aggravated by mouth breathing. Another observational pilot study showed higher incidence of gingival inflammation in patients having mouth breathing as compared to patients with nasal breathing. A higher calculus score was also observed in mouth breathers [14]. Consistent with these findings, the present case also showed increased deposits of calculus causing inflammatory gingival enlargement and mouth breathing habit.

There are contradictory studies on the relation between deep bite and malocclusion. Few authors noticed adverse effects of malocclusion on periodontal health causing inflammation, infection and gingival enlargement, whereas few authors found no relation between malocclusion and gingival inflammation [14-17]. Recently, a case reported of the traumatic effects of deep bite causing excessive functional stresses on the periodontium leading to inflammatory changes [18]. On similar lines, the present case showed the aggravated effects of deep bite on gingiva in the form of gingival enlargement and inflammation.

## Conclusion

The present case report highlights the non-surgical management of inflammatory gingival enlargement associated with mouth-breathing habit, deep bite and incompetent lips. Management of such cases requires a collaborated effort of the dentist/periodontist, general physician and ENT specialist. This type of comprehensive approach helps us to manage and maintain controlled oral status.

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