

Proximal Relationship Between Hypothyroidism and Periodontitis: “A Clinical Representation”

Abstract:

Hypothyroidism is a systemic condition in which thyroid gland is underactive and production of thyroid hormones is diminished, resulting in metabolic slowdown.

Thyroid disease can lead to imbalance in hemostasis of the body and affect the healing capacity of tissues. This case report presents the influence of thyroid hormone dysfunction and its impact on periodontal disease progression in 55 year old female patient giving the chief complaint of bleeding gums and increased gum size. The report emphasizes the need for interventions by health care providers in patients with hypothyroidism to preserve their oral and overall health.

Keywords: Periodontitis, hypothyroidism, thyroid hormone, gingival inflammation

Introduction:

Hypothyroidism is the glandular disorder, hormonal abnormality in humans. Symptoms of this disease may manifest as asymptomatic to multisystem involvement.[1] In hypothyroidism there is decreased production of thyroxine (T4), triiodothyronine (T3), and calcitonin.[2] (Little, 2006) hormones which causes decreased bone metabolism, maturation, and turnover and negatively affects bone homeostasis.[3] Periodontitis is one of the prevalent oral condition affecting the mankind today because of lifestyle related disorders. The association between periodontal disease and hypothyroidism might be due to common immunoinflammatory pathways in disease pathogenesis.[4] The fact is well established that the endocrine system can modulate the immune system in a bidirectional manner.[5] It has been hypothesized that inflammatory mediators such as prostaglandin E2, interleukin-1 β , tumor necrosis factor- α , and matrix metalloproteinases released locally as a consequence of periodontal disease lead to an alteration in bone hemostasis and might represent a risk factor for other systemic diseases.[4,6] Indeed, the relationship between hypothyroidism and periodontitis offers a potential explanation for how acute and chronic inflammation, such as what occurs during periodontitis, might affect thyroid hormone production.[7]

However, there is a paucity of documented literature assessing the relationship between thyroid hormone imbalance and periodontal health. This case report presents a patient with periodontal disease and hypothyroidism.

Case history:

A 55 year old female patient reported to the Department of Periodontics with the chief complaint of bleeding gums and increased gum size. Patient was apparently asymptomatic 1 year back then she started experiencing an increase in size of gums. Patient also gave the history of hypothyroidism for the past 5 years but had not been taking medication for the past 2 years.

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Hematological Examination:

Since the patient stopped taking medication since last two years, a complete blood picture was needed to assess systemic thyroid hormone levels. On chemiluminescent immunoassay, thyroid stimulating hormone (TSH) levels were found to be more than 150 μ IU/mL. Thus, increase in the severity of hypothyroidism was noted. On further investigation she gave the history of abrupt increase in body weight and bulkiness on face since the past 6 months. Patient did not present any past relevant dental or medical history.

Intraoral examination:

On intraoral examination, subgingival calculus, periodontal pocket ranging 6-8mm in depth with respect to teeth number 11,12,16,17,21,23,26,27 with reddish pink, enlarged, bulbous, nonscalloped, soft, edematous, rolled out margins (nondeflecting contours) of gingiva with loss of stippling and bleeding on probing were found in associated sites. OHI-S and Plaque index of the patient is 2.83 and 1.2 respectively which stated fair oral hygiene of the patient. The case was classified as localized stage II, grade B periodontitis (Figure 1).

In dentistry, prevalence and severity of the periodontal diseases in patients with hypothyroidism have been documented in the literature. However, there were only few studies reported presenting the relationship between periodontal diseases and hypothyroidism.



Figure 1 - Clinical picture at baseline

Therapeutic intervention:

As patient was systemically compromised, consent from endocrinologist was sought before carrying out any dental treatment.

Phase 1 periodontal therapy involving oral hygiene improvement and maintenance instructions along with intensive oral prophylaxis and medication for hypothyroid

condition as prescribed by endocrinologist was provided to the patient. After phase 1 therapy, patient was recalled and reevaluated after one month (Figure 2). No major changes in the clinical condition was observed. Bulkiness of the gingiva and bleeding of probing were still present despite of absence of subgingival deposits.



Figure 2 - Clinical picture at 1 month

Follow up and outcomes:

Patient was advised for meticulous oral hygiene practices and to continue medication for hypothyroid condition. Patient was then recalled after 3 months. Marked improvement was seen in the Periodontal condition following 3 months. Bulkiness of gingiva, pocket depth and bleeding on probing was substantially decreased.

Patient was recalled every 3 months (Figure 3) to keep a check on the systemic thyroid hormone levels and compliance with the supportive periodontal therapy. At 6 month (Figure 4), patient presented with healthy periodontal condition. The gingiva appeared to be normal in terms of colour, size, consistency, contour and surface texture.

In addition, the patient happily mentioned about reduced bulkiness of face and bodyweight expressing her desire to show compliance with medications and supportive periodontal therapy.



Figure 3 - Clinical picture at 3 months



Figure 4 - Clinical picture at 6 months

Discussion:

Serum TSH concentrations represent the most reliable indicators of thyroid status. The American thyroid association recommends that all patients should obtain a serum TSH determination at the age of 35 years and be followed up every 5 years.⁸ Treatment should be initiated at low doses with slow titration based on serum thyroid-stimulating hormone (TSH) assessment. Normal serum TSH ranges are higher in the elderly patient; thus, higher serum TSH goals may be needed as a patient ages. The American Thyroid Association (ATA) suggests the target serum TSH to 4-6 mIU/L in people age 70 to 80 years.

It is also a commonly prevailing disorder in the adult Indian population and is common among pregnant females. Patients with hypothyroidism have increased subcutaneous mucopolysaccharides due to decrease in the degradation of these substances. The presence of excess subcutaneous or subepithelial mucopolysaccharides may decrease the ability of small blood vessels to constrict and may result in increased bleeding from infiltrated tissues including the mucosa and skin. Hence, the determination of the influence of thyroid hormone imbalance in periodontitis may be important for the prevention of morbidity related to this condition.^[11]

In the present clinical scenario, the patient complained about increase in gum size with local factors involvement. Initial approach to tackle the case was treatment of periodontitis along with the normalization of TSH levels following which size of the gums decreased substantially and so was bleeding. But this took whole of 6 months due to the susceptibility of hypothyroid patients to infection leading to longer exposure of the unhealed tissue to pathogenic organisms.

Patients with hypothyroidism have increased subcutaneous or subepithelial mucopolysaccharides which decreases the ability of small blood vessels to constrict resulting in

increased bleeding from gums.¹¹ However, in this case, phase 1 therapy was initiated along with therapy for hypothyroidism under medical supervision. Hence, while treating oral disease with underlined systemic hormonal abnormality, goal should be to impart implement synergistic preventive and therapeutic modalities to the patient for the speedy and healthy recovery.

One of the strength while handling this case was association of medical and dental care associated with the institution. Interdisciplinary discussions and approach for the treatment made it more feasible to handle the present case and treating it in righteous way.

The results suggest that patient of periodontitis with hypothyroidism can not be treated alone with periodontal therapy but should be treated along with medication of hypothyroid condition. This gives the appropriate results.

Informed consent: Patient provided informed consent to publish her case report when asked for.

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