CASE REPORT

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Ligneous Periodontitis: A Case Report with Different Treatment Approaches and Eleven Years of Follow Up

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ABSTRACT Ligneous mucosal disease is a rare, destructive condition of plasminogen deficiency characterized by generalized membranous gingival enlargement leading to rapid tooth loss. We report a case of long-standing, generalized ligneous periodontitis with an eleven years of follow-up. The patient did not have any extra oral lesions although she had been suffering from plasminogen deficiency. Treatment approaches had no benefit. An abnormal healing process is the main pathogenetic mechanism; still, intensive periodontal health care is essential for the patients who suffer from ligneous mucosal disease. This report describes a ligneous periodontitis case with a history of ligneous conjunctivitis and its clinical and histopathologic findings, therapeutic approaches and eleven years of follow-up.

Keywords: Gingival hyperplasia; plasminogen deficiency; fibrin; treatment outcome

Ligneous periodontitis (LP) is a progressive entity, which is a part of a systemic disease caused by plasminogen deficiency (PGLD) and fibrin deposition.[1,2] It is a rare condition characterized by gingival enlargement, gingival swelling and aggressive periodontal tissue destruction.[3-5] Hyperplastic generalized gingival lesions have also been reported in association with ligneous conjunctivitis.[1,6,7] Poor oral hygiene, local factors such as infections, irritations and surgical procedures may predispose to the formation of new ligneous lesions.[8,9] This article describes a LP case with a history of ligneous conjunctivitis and reports its clinical and histopathologic findings, therapeutic approaches and eleven years' follow-up.

CASE REPORT

CLINICAL EXAMINATION

A 31 years old Turkish woman was referred to Gazi University Faculty of Dentistry, Department of Periodontology for evaluation of gingival enlargement with bleeding in 2008. The intraoral examination revealed a painless, nodular, fragile, pale-pink gingival overgrowth in the upper anterior and lower molar gingival areas (Figure 1a). In addition, white-yellow coloured lesions were noted, which had a tendency to bleed. The patient also had hypersensitivity adjacent to the gingival lesions. Panoramic radiography showed extensive bone loss and severe furcation defects in both the maxilla and mandible (Figure 2). There was no family history of similar lesions but the mother had lost several teeth at a young age. The patient's parents were consanguineous. The patient also had eyelid lesions histologically diagnosed as ligneous conjunctivitis that had been excised when she was 5 years old. Medical examination of the patient revealed hypothyroidism and small nodules on her thyroid, which were under the control of a physician. There was no history of prolonged use of medication except for levothyroxine sodium for hypothyroidism

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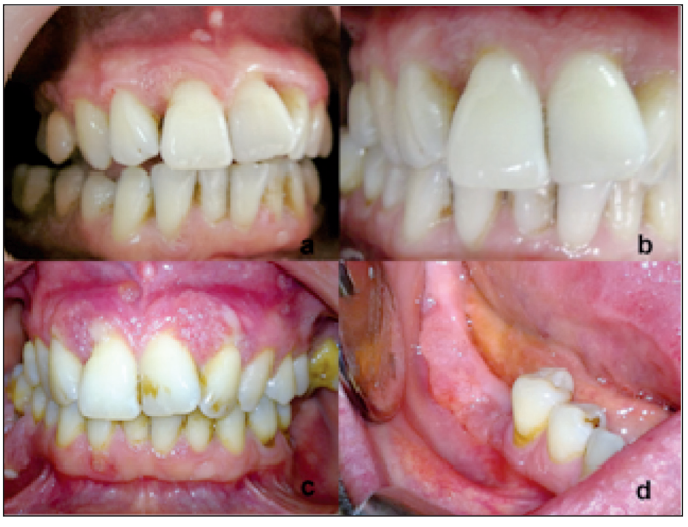

FIGURE 1: a) Clinical view of the lesions at the first visit in 2008. **b)** Recurrent lesions in a month. **c)** Rapid recurrence of the nodular lesions. **d)**. Lesions were recurred even at the extraction sites.

for the previous 2 years. The patient had been smoking 10 cigarettes daily for the previous 10 years. The patient was diagnosed with aggressive periodontitis. An excisional biopsy and smear specimen of the gingival lesions were taken. The histopathologic examination returned a diagnosis of LP and candida was negative. The patient was referred to the haematology, dermatology and ophthalmology clinics. According to complete blood count results, her white blood cell count-leukocytes were higher and vitamin B12 levels were lower than normal. Biochemical test results showed that protein S levels and antithrombin III activity were lower than normal. The coagulation analyses revealed a decreased PGL activity of 40% (reference range 55-145%) consistent with PGLD. Genetic analysis of the PGL gene showed homozygous mutation for MTHFR (C677T) and heterozygous mutation for Factor II Prothrombin (G202 10 A) and Factor V Leiden (G1691A).

HISTOPATHOLOGIC EXAMINATION

The mucosal epithelium showed irregular hyperplastic down-growth, intraepithelial oedema, keratinocyte detachment and hyaline apoptotic cells. A polymorphonuclear leukocyte-rich exudate and intraepithelial cyst-like structures were observed in the epithelium. In the lamina propria, mononuclear cell infiltration was predominant. In the subepithelial connective tissue there was an accumulation of acellular, nodular, amorphous, amyloid-like, eosinophilic material. The material was negative for amyloid with Congo Red stain, lacking the typical apple green birefringence. The material was stained red with Masson Trichrome stain in contrast to the green collagenous connective tissue and was showed bright Periodic acid–Schiff (PAS) positivity (Figure 3).

TREATMENT APPROACHES

The informed consent was taken before the therapy. The patient underwent non-surgical periodontal therapy (NSPT) including oral hygiene instruction, scaling, and root planning under local anaesthesia. NSPT was accompanied by a rinsing solution twice a day (benzamine HCl (0.15%)+ chlorhexidine gluconate (CHx) (0.12%)) and a systemic antibiotic therapy (doxycycline 100 mg/day) once a day for two weeks. Four weeks after baseline, the patient underwent gingivoplasty and gingivectomy on the affected sites.

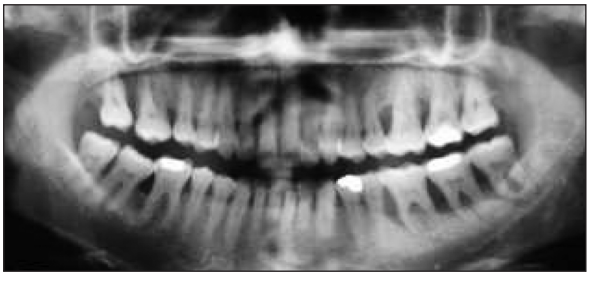

FIGURE 2: Panoramic radiograph showed extensive bone loss.

The histological findings of the excised gingival sample re-confirmed the diagnosis of LP. However, the lesions invariably recurred within a month, despite regular control to maintain good oral hygiene (Figure 1b). A topical corticosteroid pomade with triamcinolone acetonide and betamethazone propionate was recommended for the recurrent lesion sites twice a day for two weeks. Topical fluoride application was performed for hypersensitivity. The patient's right maxillary first and second molars, and right and left mandibular third molars were extracted, but the patient refused extraction of the other teeth that had incurred severe bone loss as seen on panoramic radiography (Figure 4). The patient also refused to use systemic steroid medication except vitamin complex prescribed by the dermatologist. The haematologist did not recommend any medication but regular check. Three months later, another gingivectomy was performed from the right mandibular canine teeth through the second molar and maxillary anterior region. Surgical excisions of gingival lesions were followed by rapid recurrence of membranous lesions and it was noted that the lesions had a tendency to spread and that the therapy was ineffective (Figure 1c). A panoramic radiograph was taken and the treatment protocol (NSPT, CHx rinse and topical corticosteroid pomade) was again performed however, no effect was observed. An allergy test showed that the patient was allergic to toothpastes containing sodium lauryl sulphate; thus, another toothpaste was recom-

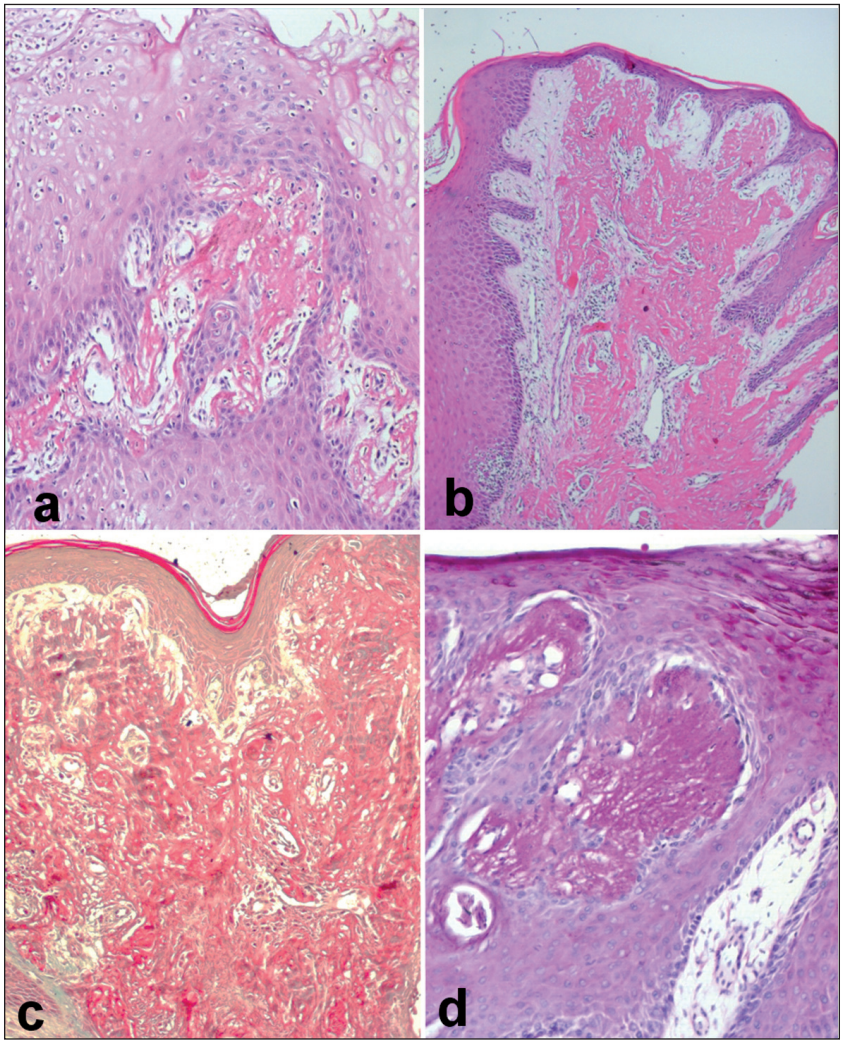

FIGURE 3: a) Fibrin accumulation beneath hyperplastic and moderately inflamed epithelium, Hematoxylin and eosin, x200. **b)** Acellular, nodular, amorphous, amyloid-like material, Hematoxylin and eosin, x40. **c)** The material showed red staining with trichrome stain, Masson Trichrome, x100. **d)** Bright red PAS positivity was noted, Periodic acid-Schiff, x200.

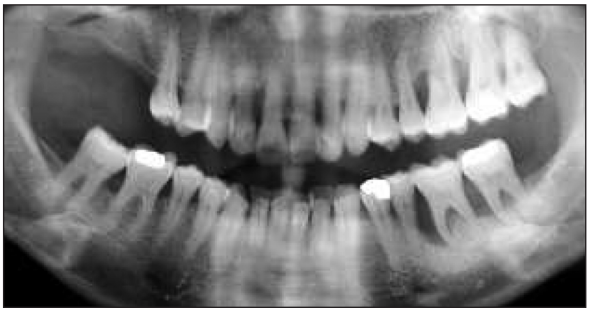

FIGURE 4: Severe furcation defects and bone loss.

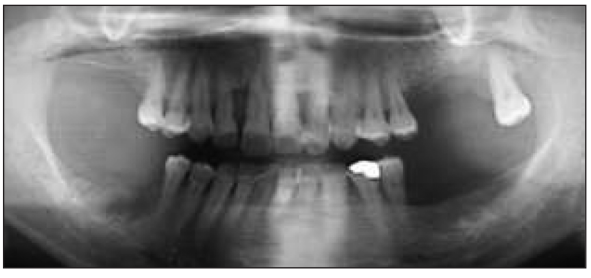

FIGURE 5: The last panoramic radiography showed severe bone loss on maxillary anterior area.

mended. After one year, the patient returned with an aggressive clinical state comprising recurrent lesions and hyperplastic gingiva with bleeding. She had given up smoking five months previously. The treatment protocol and gingivectomy with a diode laser were performed and the left mandibular first and second molars were extracted due to severe bone loss. The patient refused to wear an offered removable partial prosthesis and these lesions recurred aggressively six months afterward (Figure 1d, Figure 5). The patient was recalled twice each year and clinic, radiographic evaluations were performed and the treatment protocol was repeated at these appointments for almost ten years.

DISCUSSION

LP is a sporadic, rare periodontal disease and it appears as massive, painless gingival enlargement and severe alveolar bone destruction in the affected area. The course of the disease is progressive and typically ends up with early tooth loss.[10] Scully et al. reported that gingival overgrowth with ulceration appears to be a complication of PGLD.[7,11] In patients with PGLD, the wound-healing capability seems to be halted at the stage of granulation tissue formation.[10,12] The pseudomembrane formation can also develop on the mucosa of the oral cavity, the nasopharynx and the female genital tract.[3,9,13] When other tissues are involved, most reported oral lesions are observed together with ligneous eyelid lesions.[14] Similarly, our patient also had nodular eyelid lesions which had previously been excised at the age of 5 and histologically diagnosed as ligneous conjunctivitis. Our patient did not have any lesions related to the disease except intra-oral lesions. Tefs et al. examined a series of 50 patients with type-1 PLGD who were mainly of Turkish descent.[9] In that study, the parents of 21 of the cases were consanguineous and 19 of these couples were also Turkish. The patients in the cases considered were mostly female.[15] Similarly, our patient is a Turkish woman whose parents were cousins.

In the literature, gingival recurrence and rapid growth of pseudomembranous lesions have been reported after surgical excisions, in some cases, spontaneous regressions were only noticeable after tooth extractions.[10] In our case, the re-evaluation of the gingivectomy sites showed a rapid recurrence of membranous lesions. We also noticed regrowth of the ligneous lesions at the extraction sites after the healing period. Our patient's histopathological examination results and prognosis were similar to the previous study findings.[1] In the literature, several periodontal and surgical treatment alternatives for LP have been tried but have been only partially successful, and therapy has resulted in limited success and loss of teeth. Various authors have reported periodontal treatment of gingival lesions with NSPT, CHx rinsing, gingivectomy and antibiotic therapy.[1,3,9,13,15] In our case, the similar attempts above have been performed, but have failed and resulted in the rapid regrowth of pseudomembranes and eventual tooth loss. Tefs et al. reported that there was only one patient who was able to receive dental implants after a complex therapy with surgical removals of ligneous lesions, using heparin shots after the surgeries, daily warfarin sodium, and fluticasone propionate and salmeterol twice daily.[9] Silva et al. described a case with ligneous gingivitis and conjunctivitis treated with gingivectomy followed by CHx and dexamethasone elixir, topical and systemic heparin and corticosteroids. They re-

ported no efficacy of CHx and heparin protocols but complete regression of the oral lesions after systemic and topical corticosteroids.[13] Our patient did not use systemic corticosteroids but topical ones. Although ligneous membranous lesions regressed slowly after topical corticosteroid pomade application, recurrences of the lesions were seen after a time. Fine et. al reported a case with homozygous PLGD and ligneous gingivitis, including involvement in the genital tract.[13,15] They performed a surgical excision of the oral lesions and prescribed a CHx mouth rinse, therapy with low-dose doxycycline and warfarin daily. The results revealed no recurrence and no increased tooth mobility; therefore, they claim success in the treatment with warfarin and low-dose doxycycline. Kurtulus et al., performed gingivectomy followed by topical application of standard heparin in combination with a corticosteroid pomade and drops, but the lesions recurred.[10] Scully et al. has suggested the use of PLG concentrates prepared in the form of a mouthwash, but the availability of topical PLG therapy for oral manifestations has yet to be evaluated.[11] Our patient's PLG level was not low enough to require systemic PGL concentrates. However, as was highlighted in our case, clinical appearances and biochemical findings may not always be compatible. Studies shows that LP is a difficult condition to manage, has no certain treatment options, and deserves further study.

At present, LP treatment options seem to have limited success. Additional investigations are needed focusing on the development of an effective therapy that can arrest the destructive course of LP.

Source of Finance

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Gülay Tüter;* ***Design:*** *Gülay Tüter;* ***Control/Supervision:*** *Gülay Tüter, Benay Yıldırım, Burcu Sengüven Toközlü;* ***Data Collection and/or Processing:*** *Gülay Tüter;* ***Analysis and/or Interpretation:*** *Gülay Tüter, Benay Yıldırım, Burcu Sengüven Toközlü;* ***Literature Review:*** *Gülay Tüter, Benay Yıldırım, Burcu Sengüven Toközlü;* ***Writing the Article:*** *Gülay Tüter, Benay Yıldırım, Burcu Sengüven Toközlü;* ***Critical Review:*** *Gülay Tüter, Benay Yıldırım, Burcu Sengüven Toközlü;* ***References and Fundings:*** *Gülay Tüter, Benay Yıldırım, Burcu Sengüven Toközlü;* ***Materials:*** *Gülay Tüter, Benay Yıldırım, Burcu Sengüven Toközlü.*

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