

Localized Juvenile Spongiotic Gingival Hyperplasia: Report of Two Cases

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Objective: Localized juvenile spongiotic gingival hyperplasia (LJSGH) is a painless gingival swelling that histologically exhibits hyperplasia of the non-keratinized stratified squamous epithelium, intercellular edema and spongiosis of the spinus layer, and exocytosis of inflammatory cells. LJSGH pathogenesis remains to be elucidated, while a possible origin from the gingival sulcus epithelium is nowadays proposed. **Study design:** We report two cases of LJSGH with immunohistochemical evaluation of cytokeratins (CKs) 18 and 19. **Results:** Both cases concerned 12-year-old boys, who presented with a well-circumscribed bright red pedunculated papillary swelling on the marginal gingiva of the left maxillary lateral incisor. With the provisional diagnosis of LJSGH, the lesions were excised under local anesthesia and histological examination supported the final diagnosis of LJSGH. In both cases, the lesional epithelium showed intense and mild positivity for CK19 and CK18, respectively, while the adjacent normal gingival epithelium expressed CK19, but not CK18, only in the basal cell layer. The postoperative course was uneventful in both patients and no recurrence has been reported. **Conclusion:** LJSGH is a recently introduced entity that is worth attention in the clinical pediatric dentistry. Clinical and histological examination is required for the final diagnosis, while immunohistochemistry has shed light to LJSGH pathogenesis.

Key words: gingiva, hyperplasia, juvenile, spongiotic, immunohistochemistry, cytokeratin 19; cytokeratin 18.

INTRODUCTION

Localized juvenile spongiotic gingival hyperplasia (LJSGH) is a gingival hyperplasia with unique clinicopathologic presentation¹ that was initially described as *juvenile spongiotic gingivitis* (JSG) and considered to be the gingival counterpart of *acute spongiotic dermatitis*.² The term LJSGH is preferred by most authors as it better delineates its features and emphasizes its hyperplastic nature. However, multifocal gingival involvement¹⁻⁴ and cases in adults⁵ have been described; therefore the lesion may be neither *localized* nor *juvenile*.

LJSGH seems to be a rare lesion. In one study it represented 0.069% of 31,469 specimens accessioned in an oral pathology laboratory,³ and in the English language literature there are approximately 10 well documented publications.^{1-4,6-11} However, cases of LJSGH may have been misdiagnosed as pyogenic granuloma or gingivitis, in particular puberty gingivitis.^{1,2}

LJSGH typically presents on the facial maxillary gingiva of young patients as a localized and solitary slightly mass up to 1cm in diameter, with bright red color, and papillary, granular, pebbly or velvety surface that is painless, but may bleed on teeth brushing.¹⁻³ Its etiology remains obscure and an origin from the junctional epithelium of the gingiva is suggested.^{1,2,6}

Only a few case reports of this unusual lesion have been published in the pediatric dentistry literature, although pediatric dentists are the health providers more likely to first examine a patient in this age group. Therefore, the clinical, microscopic and immunohistochemical features of two new cases of LJSGH are described, and the pertinent literature is reviewed.

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Case reports

Case 1

A 12-year-old boy was referred by his dentist for evaluation and management of a painless erythematous swelling on the left side of the facial maxillary gingiva, noticed approximately 6 months before presentation. His parents reported that it “slightly shrank” following plaque debridement 5 months ago, while rinses with Povidone-iodine oral antiseptic solution twice daily for 2 weeks were ineffective. The patient’s medical and family history was noncontributory.

Intraoral examination revealed a well-circumscribed, bright red, pedunculated swelling with granular surface, approximately 1cm in greatest dimension, on the marginal and attached gingiva of the left maxillary lateral incisor that seemed to grow from the dentogingival junction (Fig. 1). The lesion was non-hemorrhagic on palpation and examination with a periodontal probe. The surface of the corresponding tooth was covered by dental plaque. No other intraoral or extraoral abnormalities were observed. A dental X-ray did not show bone involvement.

The clinical diagnosis was LJS GH and the lesion was totally excised under local anesthesia.

Case 2

A 12-year-old boy was referred by his pediatric dentist for diagnosis and management of an asymptomatic red mass on the facial anterior maxillary gingiva, of approximately 2 months duration. The patient had been diagnosed with “ulcerative colitis” a year before presentation.

Clinical examination revealed a well-defined bright red, pedunculated mass, involving the facial marginal gingiva of the left maxillary lateral incisor that extended to the interproximal area between the two maxillary left incisors. It measured approximately 1cm in greatest dimension, had a granular surface and was soft, non-hemorrhagic on palpation. The patient oral hygiene was poor, as indicated by the presence of calculus deposits in most of his teeth. The rest of oral mucosa was within normal limits. A dental X-ray did not reveal bone resorption.

The lesion was consistent with LJS GH and excised under local anesthesia.

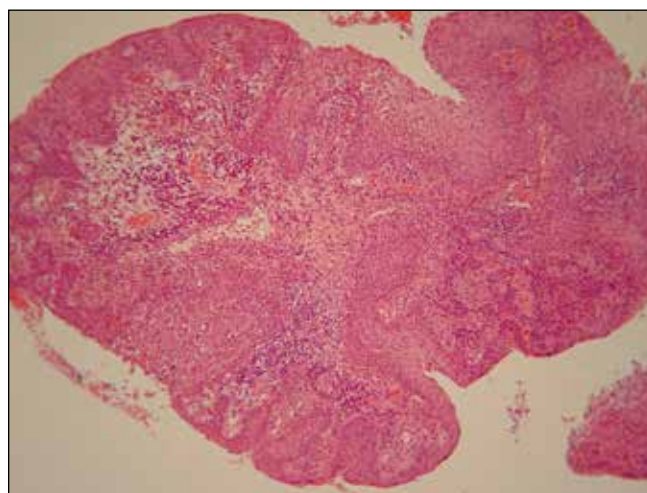
Microscopic findings

Grossly, both lesions had solid, gray cut-surface and measured 1cm in greatest dimension. Microscopic examination of 5 μ m thick formalin-fixed and paraffin-embedded tissue sections stained with hematoxylin and eosin showed a mucosal fragment covered by spongiotic and acanthotic non-keratinized stratified squamous epithelium, displaying papillomatosis, intercellular edema and neutrophilic exocytosis (Fig. 2A, 2B, 2C). The underlying connective tissue was edematous and vascular, with many dilated and congested vessels, and was diffusely infiltrated by lymphocytes, plasma cells, and neutrophils. Examination under polarized light did not show birefringent exogenous material and Periodic acid-Schiff staining did not reveal fungal hyphae. The final diagnosis was LJS GH.

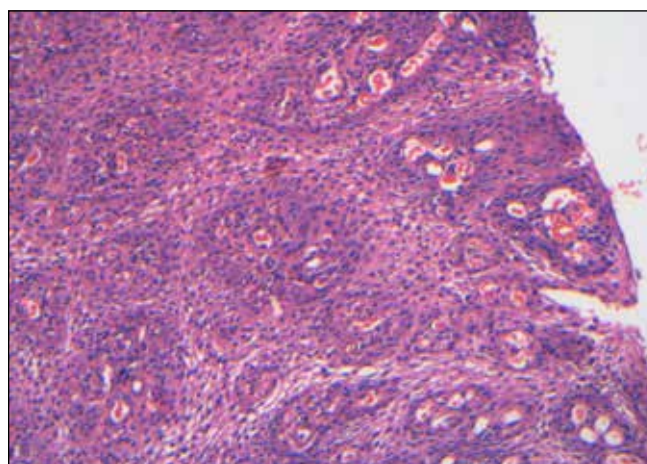
Fig. 1: A well-defined, bright red, pedunculated papillary mass on the marginal and attached gingiva of the left maxillary lateral incisor (case 1).



Fig. 2: Microscopic examination shows a mucosal fragment covered by spongiotic, non-keratinized stratified squamous epithelium (A-case 1). Acanthosis, intercellular edema and spongiosis of the spinus layer (B-case 2), and neutrophilic exocytosis (C-case 1). (hematoxylin and eosin stain, original magnifications (A) x25, (B) x100, (C) x400).

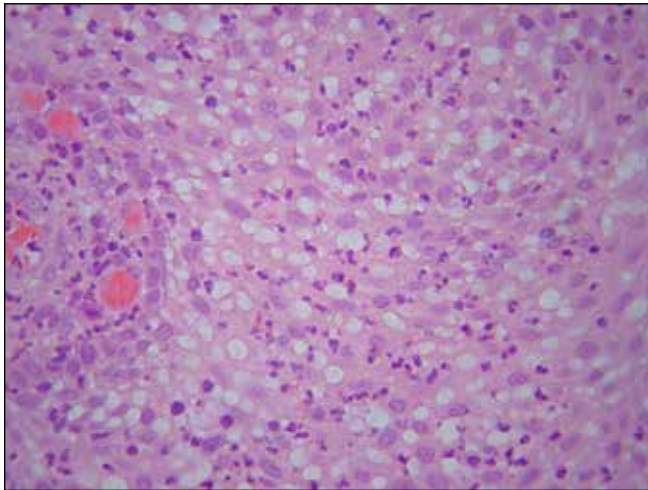


A



B

Fig. 2: Microscopic examination continued (C) x 400

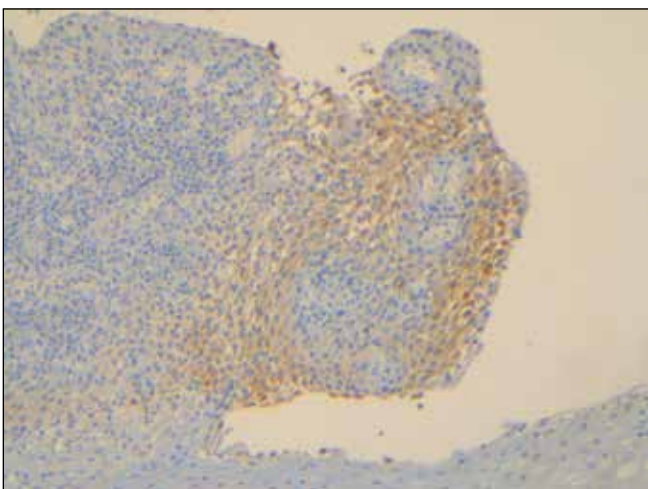


C

Fig. 3: Intense cytoplasmic expression for CK19 (A-case 2) mild cytoplasmic expression for CK18 (B-case 1) in the lesional epithelium. Notice limited basal expression and lack of expression in adjacent normal gingival epithelium for CK19 and CK18, respectively (Streptavidin-biotin-peroxidase, original magnifications (A) x25, (B) x100).



A



B

Streptavidin-biotin-peroxidase immunohistochemistry for the monoclonal mouse anti-human cytokeratins (CK) CK19 (1:100, Clone RCK108, Dako, Glostrup, Denmark) and CK18 (1:50, Clone DC10, Dako, Glostrup, Denmark) was performed with the Ventana BenchMark XT fully automated slide preparation system (Ventana Medical Systems Inc., Tucson, AZ) and the iView DAB detection kit (Ventana). In both specimens the lesional epithelium showed in all cell layers intense cytoplasmic expression for CK19 (Fig. 3A) and mild for CK18 (Fig. 3B), while the adjacent normal gingival epithelium was CK19+ only in the basal cell layer, but CK18-.

The postoperative course of the patients was uneventful and no recurrence has been reported during the 12-month and 17-month follow-up period, respectively.

DISCUSSION

The cases presented herein showed the diagnostic microscopic features of LJSJGH, i.e. papillary, acanthotic, non-keratinized stratified squamous epithelium, intercellular edema and spongiosis of the spinus layer, and exocytosis of acute or chronic inflammatory cells.¹⁻³

Both our patients were 12-year old boys. Most patients with LJSJGH are 10-15-year old, the age range is 5-39 years and the average age is 11.8-13 years.¹⁻³ In three large series only 3 cases were found in patients older than 20 years,¹⁻³ but in a recent study,⁵ 19 cases consistent with LJSJGH were found in patients aged 21-84 years, after retrospectively reviewing a sample of pyogenic granulomas. A 2.3:1 female predominance,¹ 2:1 male predominance,³ or equal sex distribution,² as well as a racial predilection for Caucasians^{1,3} is reported. Time to diagnosis is 1-36 months,^{1,2} and in our patients the localization of the lesion on the facial maxillary gingiva helped the prompt recognition of the lesion by the parents.

As in our cases, the facial maxillary gingiva are more commonly involved,^{1,3} while few lesions are described on the posterior maxilla,^{2,3} and rare cases on the mandibular^{1,3,4} or lingual gingiva.^{2,4} The marginal gingiva is mainly affected, but the attached or interproximal gingiva may be also involved, as was evident in case 2.^{1,2} Multifocal lesions seem to be rare,^{1,4} but this may be an underestimation, as it is possible that such cases may be diagnosed as puberty gingivitis and not subjected to biopsy.

The clinical and histological differential diagnosis of LJSJGH has been thoroughly discussed in previous studies.^{2,4} The most common clinical diagnosis is pyogenic granuloma, and the differential diagnosis may include peripheral giant cell granuloma, benign vascular lesions, such as hemangioma and arteriovenous malformation, vascular lesions associated with immunosuppression, such as Kaposi sarcoma and bacillary angiomatosis, and Wegener granulomatosis. Clinical diagnosis in multifocal cases of LJSJGH includes puberty gingivitis, plaque-associated gingivitis, allergic reaction to drugs or dental materials, plasma cell gingivitis, and “desquamative” gingivitis in an autoimmune disease, while linear gingival erythema should be considered if there is indication of immunodeficiency. Microscopically, neutrophilic exocytosis may be seen in erythema migrans, oral psoriasis, Reiter’s syndrome, and chronic hyperplastic candidiasis, lesions that do not bear clinical similarity with LJSJGH, while spongiosis may be seen in secondary syphilis and inflamed lesions of odontogenic origin.

The etiology of LJSGH is not clear. Dental plaque and calculus are profound etiologic factors, but LJSGH occasionally develops on the attached gingiva and is separated from the marginal gingiva with a strip of normal gingiva,² dental plaque and calculus deposits may be absent,³ and most lesions do not respond favorably to periodontal treatment and improvement in oral hygiene measures.^{1-3,10,12} The predilection for younger persons is indicative of hormonal influence, but no estrogen and progesterone receptors are found,² while LJSGH may appear in prepubertal children and adults.¹ Other factors considered are trauma that was documented in just one patient;³ orthodontic appliances that were present in only 8 in 52¹ and 1 in 21³ patients with LJSGH;³ and mouth breathing that is not consistent with the mostly localized distribution of the lesion. Therefore, those factors seem to be coincidental events.¹ A viral infection is suggested by epithelial hyperplasia,¹ but in one study definitive positivity for HPV DNA was found by PCR in only one adult among 21 patients and was considered coincidental.¹ Exogenous deposits or foreign body granulomas are not found on conventional and polarized-light microscopic examination.¹³ The localized nature of the lesion is not consistent with hypersensitivity,¹ but the recognition of eosinophils and mast cells in similar lesions developing in adults suggests a hypersensitivity reaction to some undefined environmental factors.⁵ The positive response following plaque debridement in our case 1 could be subjective or related to minor recession of inflammation.

Darling et al² proposed that the epithelium in LJSGH is “remarkably similar to inflamed junctional/sulcular epithelium and periodontal pocket epithelium”. The similarity was supported by CK immunophenotype, as CK19 was strongly expressed throughout the LJSGH epithelium and junctional epithelium, but only in the basal layer of the adjacent normal oral epithelium, while there were no differences in the expression of CK5/6.² In another study,⁶ LJSGH epithelium was CK19+ and CK8/18+ in its full thickness, but CK1/10- and CK4-. In contrast, the gingival epithelium covering fibro-epithelial hyperplasias was CK19+ and CK8/18+ only in its basal layer, but CK1/10+ and CK4+, the differences being statistically significant. This CK immunophenotype in LJSGH epithelium is more consistent with normal and inflamed junctional epithelium¹³⁻¹⁶ and indicates that ectopic junctional epithelium is implicated in the pathogenesis of LJSGH.^{1,2,6} It is thought that junctional epithelium is “exteriorized” to the oral cavity and due to its structural features is more susceptible to the action of local irritation factors and becomes inflamed and hyperplastic.^{1,6} In our cases the CK19 expression pattern was consistent with LJSGH,^{2,6} while the intensity of CK18 expression was weaker than that of CK8/18,⁶ a difference that could be attributed either to the variability in the expression of CK8/18, as has been shown in normal junctional epithelium,¹⁴ or to a more intense expression of CK8 over CK18 in the previous study.⁶

Surgical excision is the treatment of choice, as LJSGH does not respond to conservative periodontal treatment,^{1,4} although there are undocumented reports of spontaneous resolution.² Laser excision is a reliable alternative.^{3,11} Recurrence ranges of 6%,¹ 9.5%,³ and 28.6%² are reported, and may manifest 2 months² to 5 years after initial excision.¹ Our cases did not recur following conservative surgical excision 12 and 17 months after treatment, respectively, although oral hygiene was not significantly improved.

CONCLUSION

Familiarity with the clinicopathologic features of LJSGH by pediatric dentists should allow the recognition of more cases of this under-diagnosed rather than rare lesion. Interestingly, although LJSGH usually affects children and adolescents, only scarce case reports exist in the pediatric literature.⁷ Description of more cases can help in elucidating its pathogenesis and improving its management.

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