Cryotherapy for Treatment of Idiopathic Gingival Papillokeratosis With Crypt Formation

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PRACTICE **POINTS**

- Surgical excision is an effective treatment for idiopathic gingival papillokeratosis with crypt formation (IGPC) but may result in periodontal defects that impact the aesthetic outcome.
- Cryotherapy is a novel therapeutic intervention for IGPC.

To the Editor:

Idiopathic gingival papillokeratosis with crypt formation (IGPC) is an uncommon benign condition that first was reported in 1967.[1] The condition manifests as white plaques with a papillary appearance on the gingival tissue. While data on the prevalence of IGPC are limited, it is known to occur more frequently in younger patients (ie, 9-24 years[1-3]) and has been linked to use of orthodontic appliances.[3,4] The lesions typically are asymptomatic with a bilateral appearance along the mucogingival junction. Research on IGPC has not identified the underlying mechanisms that trigger the hyperkeratinization and papillary alterations within the gingival tissue.

Management of IGPC can be challenging due to the rarity of the condition and its uncertain pathogenesis. Wiping or brushing the affected area offers only temporary improvement of symptoms and the appearance of the lesions. Surgical excision is another option; however, it can result in aesthetic and/or functional periodontal defects.[2] Alternately, employing methods such as wiping or brushing the affected area offers only transient and temporary results in managing the condition. Additional investigative approaches and clinical studies are needed to identify more effective therapeutic modalities for the management of IGPC, particularly in pediatric patients, in whom aesthetic results may take on a heightened importance.[1-3] We report a case of IGPC in which cryotherapy yielded satisfactory results with no recurrence of the lesions.

A 32-year-old woman presented to the dental clinic with white spots on the gingiva of 5 months' duration. The patient reported a history of smoking cigarettes (3 packs per year) and drinking alcohol in social situations; her medical history was otherwise unremarkable. Clinical examination of the oral cavity revealed a bilateral, irregular, verrucouslike plaque throughout the vestibular upper attached gingiva. An incisional biopsy from the attached gingiva between teeth 13 and 23 was performed. Histopathologic analysis revealed parakeratosis and papillary acanthosis of the gingival mucosa associated with multifocal epithelial invaginations resembling crypts as well as long tapered epithelial ridges with no inflammation in the lamina propria. Based on the histopathologic findings, a diagnosis of IGPC was made (Figure 1).

Given the patient's clinical presentation, we suggested treatment with cryotherapy as a minimally invasive option that would preserve the gingival architecture and aesthetics while avoiding the potential complications of surgical

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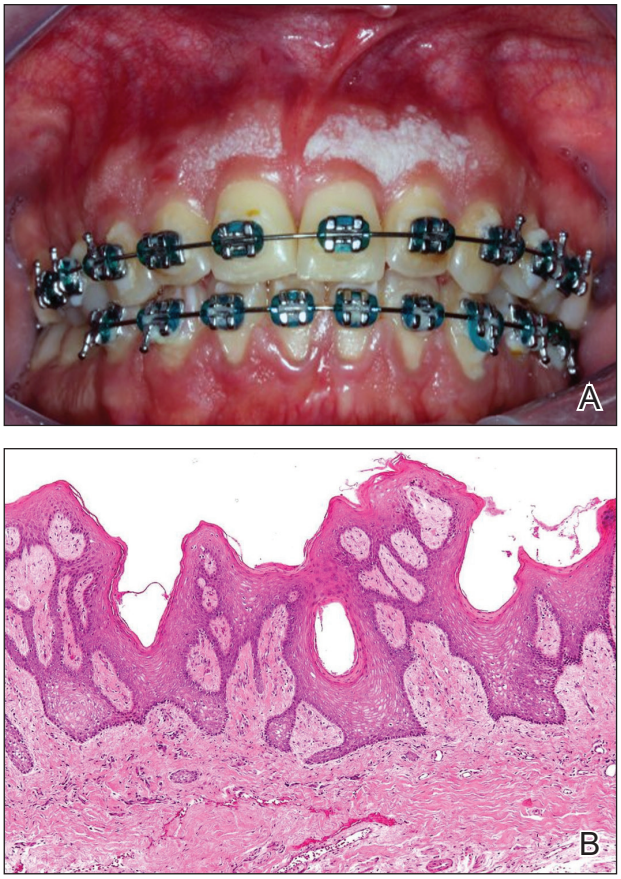

FIGURE 1. A, A verrucouslike plaque throughout the vestibular upper attached gingiva. B, Histopathology of idiopathic gingival papillokeratosis demonstrating parakeratosis with papillary architecture, cryptlike invaginations, and elongated rete ridges in epithelial tissue (H&E, original magnification ×20).

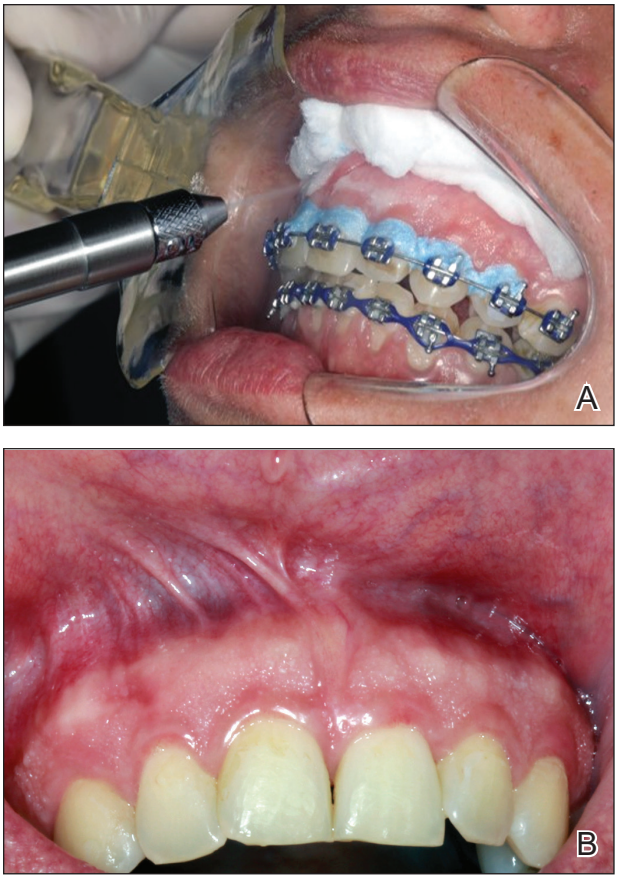

FIGURE 2. A, A thick layer of light-curing gingival barrier was applied to the teeth prior to administering liquid nitrogen onto the lesion. B, A complete remission of lesions was achieved after cryotherapy, and there were no signs of recurrence over 2 years of follow-up.

excision. The patient consented to the procedure, and liquid nitrogen was administered through a handheld device using a 0.6-mm aperture spray tip. During application, the spray tip was positioned at a distance of 0.5 to 1.0 cm from the labial marginal gingiva at about a 45° angle. The freeze/thaw cycle involved a continuous one-way spray application of liquid nitrogen onto the lesion until solid ice formed over the entire area, followed by a waiting period until gradual thawing occurred.

A total of 5 cryotherapy sessions were conducted over an 8-week period; no recurrence of the lesions was observed during a 2-year follow-up period (Figure 2).

We present our case to add to the body of knowledge regarding management options for IGPC, specifically cryotherapy. Historically, brushing with a toothbrush and surgical excision have been the most commonly used interventions.[2] Gently brushing the affected areas can help stimulate local blood circulation, which can improve the health of the gingival tissue, promote oxygenation and delivery of nutrients to the cells, and aid in the removal of metabolic waste. Surgical excision is the most commonly used treatment method for IGPC to ensure that the lesions are safely and completely removed; however, this option can result in aesthetic and/or functional periodontal defects. There also is a risk for recurrence, although Noonan et al[2] reported no recurrence 4 years after performing a surgical excision for IGPC.

Cryotherapy reduces tissue sensitivity, provides local anesthesia, and reduces inflammation in the oral mucosa. Moreover, cryotherapy accelerates healing by stimulating vasoconstriction and reactive vasodilation, thus enhancing blood flow, oxygenation, and nutrient delivery for faster cell regeneration of the oral mucosa.[4,5] Cryotherapy generally is regarded as a simple noninvasive procedure that is relatively safe when performed by qualified professionals.[4,5] It can provide benefits such as minimal patient discomfort, rapid recovery, and potential reduction of complications associated with more invasive procedures.[5]

The efficacy of cryotherapy for IGPC may vary based on lesion severity, individual patient response, and the need for repeated treatment sessions. Robust scientific evidence concerning the long-term efficacy of cryotherapy as a treatment for IGPC is limited due to the rarity of this condition.

The etiopathogenesis of IGPC has been hypothesized to involve both genetic and environmental factors with equal significance. This suggestion is based on reports of IGPC occurring in multiple members of the same family and animal model studies indicating that gingival tissue is sensitive to environmental influences, such as nutritional factors.[1,6] However, it is important to emphasize that these hypotheses remain speculative, and the true etiopathogenesis of IGPC remains uncertain.[6] Microscopically, biopsy fragments from suspected cases of IGPC reveal gingival mucosa characterized by parakeratosis and papillary acanthosis accompanied by multifocal epithelial invaginations resembling crypts.[2] Additionally, elongated and tapered epithelial ridges without inflammation in the lamina propria may be observed (as in our case), favoring the diagnosis of IGPC.[3] The absence of inflammation is noteworthy because it suggests that the observed alterations are not attributed to typical inflammatory processes seen in some gingival conditions.

The limited number of studies reporting successful treatment outcomes with long-term follow-up for IGPC cases underscores the need for further exploration of effective treatment options. Cryotherapy emerges as a promising minimally invasive therapeutic approach, with our case offering support for its potential application. Additional research and clinical trials are essential to validate its efficacy and improve our understanding of cryotherapy as a treatment modality for IGPC lesions.

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