

Tropical medicine rounds

Live bee acupuncture (*Bong-Chim*) dermatitis: dermatitis due to live bee acupuncture therapy in Korea

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E-mail: g9563009@cu.ac.kr**Abstract**

Live bee acupuncture (*Bong-Chim*) dermatitis is an iatrogenic disease induced by so-called live bee acupuncture therapy, which applies the honeybee (*Apis cerana*) stinger directly into the lesion to treat various diseases in Korea. We present two cases of live bee acupuncture dermatitis and review previously published articles about this disease. We classify this entity into three stages: acute, subacute, and chronic. The acute stage is an inflammatory reaction, such as anaphylaxis or urticaria. In the chronic stage, a foreign body granuloma may develop from the remaining stingers, similar to that of a bee sting reaction. However, in the subacute stage, unlike bee stings, we see the characteristic histological “flame” figures resulting from eosinophilic stimulation induced by excessive bee venom exposure. We consider this stage to be different from the adverse skin reaction of accidental bee sting.

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Introduction

In most cases of accidental bee sting, skin reactions develop from the bee venom. However, in Oriental medicine, doctors have used live bee acupuncture (*Bong-Chim*) therapy to relieve the chronic pain of various causes by applying the venom components directly to the lesion.¹ Bee stings can cause various skin reactions that usually resolve over several days; however, in some patients the venom acts as an allergen, causing a severe immunological response such as anaphylaxis. Bee stings can also induce chronic inflammation because the barbed stinging apparatus and venom sacs, along with the nerve plexus, can lodge in the skin.^{2,3} Live bee acupuncture dermatitis is caused by intentionally repeated stings that may show a reaction different from that of accidental bee stings. We have recently reviewed five reports dealing with this condition induced by multiple live bee acupuncture treatments (Table 1).^{1,2,4–6}

Herein, we report two cases of live bee acupuncture dermatitis in light of previously published cases, and compare the adverse reactions between accidental bee stings and live bee acupuncture dermatitis.

Case reports**Case 1**

A 44-year-old Asian woman presented with a painless and fast-growing mass on the lateral aspect of her right

leg that had persisted for two months. At the outset, a well-demarcated erythema, non-umbilicated vesicles, and edema developed at that location. The patient had received live bee acupuncture therapy on numerous occasions as folk remedies for arthralgia. After being treated with acupuncture therapy twice a week, the lesion became swollen and indurated. The patient considered it a *Myeong-Hyun* phenomenon, an Oriental medical term meaning an unexpected response developing during the recovery process, and continued the treatment.

On physical examination, we observed a 3.5 × 1.5-cm mass having an elevated, granulating base and multiple abscesses covering hemorrhagic exudates (Fig. 1). Laboratory studies, including complete blood count, routine urinalysis, and liver function test, were all within normal limits. Histological examination of the incised specimen revealed dense infiltration of inflammatory cells composed predominantly of eosinophils, numerous lymphoid cells, plasma cells, and fibroblasts in the edematous collagenous tissue (Fig. 2a). Increased, newly formed capillaries with flat endothelial cells were noted in the papillary and upper reticular dermis, and ulceration was found in the overlying epidermis (Fig. 2b). Neither atypical mitotic figures nor pleomorphic nuclei were found. Within the mid-dermis, yellow particles regarded as bee stingers were noted around the histiocytes, with the presence of multinucleated giant cells. However, there was no well-formed palisading granuloma (Fig. 2c–e). In addition, multiple

Table 1 Clinicopathological information for patients who are contemplating live bee acupuncture dermatitis

Authors	Sex/Age	Injection purpose/injection site	Number of treatment/duration	Clinical symptom	Histological feature	Diagnosis
Yu <i>et al.</i> ¹	F/43	To treat pruritic erythema/hand, foot	1 time/3 years	Erythematous papule	Lymphocytes, histiocytes, eosinophil infiltration, granuloma	Foreign body granuloma
	M/50	To treat asymptomatic nodule/left forearm	1 time/2 years	Subcutaneous nodule	Angiolipoma, granuloma	Foreign body granuloma
	F/53	To treat pruritic erythema/forehead	1 time/2 months	Erythematous patch	Granuloma	Foreign body granuloma
	F/52	To treat papules/left preauricular area	Many times/year	Ulcerative tumor	Lymphocytes, histiocytes, eosinophils infiltration, giant cell infiltration	Foreign body granuloma
Yoo <i>et al.</i> ⁴	M/45	To control pain/waist	2 times/20 days	Generalized erythematous macules, patches	Collagen degeneration, perivascular lymphocytic infiltration	Contact urticaria
Bae <i>et al.</i> ⁵	M/76	To treat eczema, subcutaneous nodule on back, right axilla	Many times/3 years	Plaque with central ulcer	Lymphocytes, histiocytes, eosinophils, giant cell infiltration	Foreign body granuloma
Song <i>et al.</i> ⁶	F/42	To control pain/neck, shoulder	15 times/20 days	Wheal, flare, dyspnea	–	Anaphylaxis
	F/39	To control pain/waist	2 times/2 weeks	Wheal, flare, dyspnea	–	Anaphylaxis
	F/44	To control pain/right leg	Many times/2 months	Ulcerative tumor	Lymphocytes, histiocytes, eosinophil infiltration, flame figures	Live bee acupuncture dermatitis
Present case	M/10	To treat eczema/left flank	Many times/2 years	Whitish plaque with erythematous papules	Lymphocytes, histiocytes, giant cell infiltration, granuloma	Live bee acupuncture dermatitis



Figure 1 Lesion on lateral side of the right leg. Note large, indurated mass with hemorrhagic, non-follicular pustule and ulcer

flame figures, characterized by eosinophilic granular deposits with foci of degenerated collagen bundles, were observed in the dermis (Fig. 2f,g). The patient was diagnosed with live bee acupuncture dermatitis; wide excision was the mode of treatment.

Case 2

A 10-year-old Asian boy presented with a tender, indurated plaque containing erythematous papules on the left side of his trunk that had waxed and waned for about two years while receiving over 20 regular live bee acupuncture treatments for the eczema. During the acupuncture

therapies, the eczematous lesion had undergone repeated remissions and exacerbations and finally became enlarged and indurated. Despite the lesion's exacerbations, the patient continued receiving treatments because his parents considered it a *Myeong-Hyun* phenomenon.

On physical examination, the lesion was found to be about a 3 × 3-cm plaque with an elevated, whitish, scar-like base and multiple erythematous papules (Fig. 3). His own and family histories were not significant. All routine laboratory tests were within normal limits. Histopathological examination showed unremarkable epidermis, moderate infiltrate of inflammatory cells consisting mainly of lymphocytes in the dermis, and fibroblasts within dense collagen (Fig. 4a). In addition, there was a focus of a foreign body granuloma containing yellowish refractile material in its center, surrounded by histiocytes and foreign body giant cells in the deep dermis (Fig. 4b). The patient was diagnosed with live bee acupuncture dermatitis. Bee stinger removal and intralesional injections of triamcinolone acetonide comprised the treatment.

Discussion

In Korea, doctors of Oriental medicine have treated various diseases with bee venom, calling it *Bong-Chim* therapy. *Bong* and *Chim* are Sino-Korean words meaning bee and stinger or acupuncture. There are two modalities in *Bong-Chim* therapy. One is live bee acupuncture, which applies honeybee (*Apis cerana*) stingers directly into the

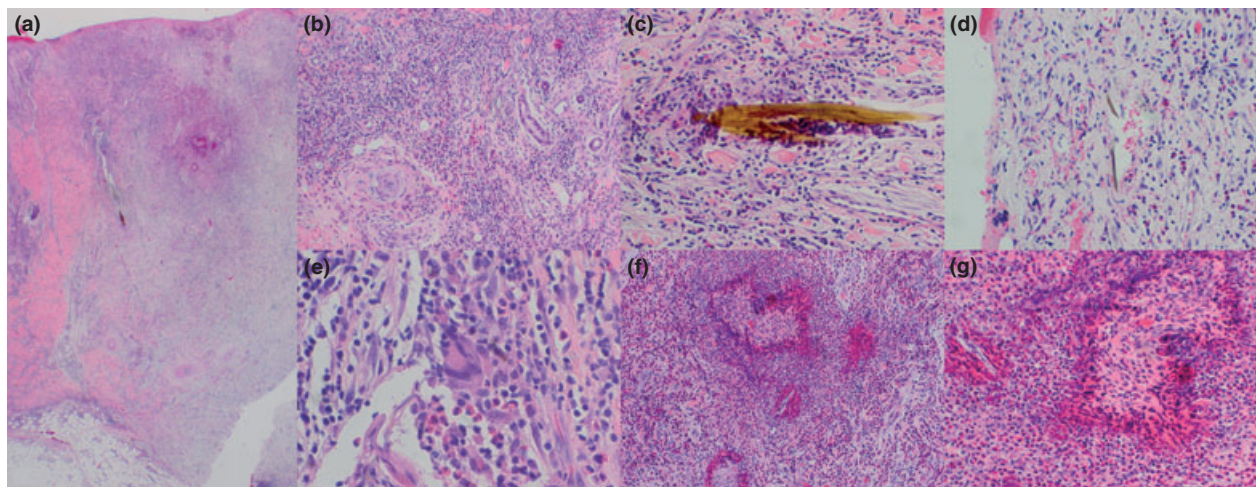


Figure 2 (a) Diffuse inflammatory cellular infiltration throughout the dermis with epidermal ulceration (H&E, ×10). (b) Capillary proliferation and dense inflammatory cell infiltration consisted mostly of eosinophils on loose edematous stroma (H&E, ×100). (c and d) Yellow refractile materials surrounding histiocytes and lymphocytes (H&E, ×200). (e) Multinuclear giant cell surrounding histiocytes, eosinophils and lymphocytes (H&E, ×400). (f) Flame figure showing central collagen bundle encrusted with eosinophilic granules and numerous eosinophils (H&E, ×200). (g) Note focal necrobiosis of collagen with expelled eosinophilic granules (H&E, ×200)



Figure 3 Lesion on left side of the trunk. Note plaque accompanied by elevated, whitish scar-like base and multiple erythematous papules

lesion, and the other is injection of extracted bee venom into the lesion with a syringe. The former is a traditional and popular modality, whereas the latter has only recently been attempted. Many people who have received live bee acupuncture therapy have reported skin symptoms, which are called *Bong-Chim* dermatitis, and more precisely defined as live bee acupuncture dermatitis. Up to now, we have reviewed ten such cases, including our two cases. We believe these cases can be classified by their characteristics into three groups as acute, subacute, and chronic.

In the acute stage, patients have clinical symptoms with an immediate allergic response, such as wheal, flare, dyspnea, and generalized erythematous macules and patches. Histopathological examination shows nonspecific features, such as acute spongiotic dermatitis, as in urticaria and allergic contact dermatitis. Duration of the acute stage in our patient was <20 days, which is much shorter than in other cases. In general, live bee acupuncture therapy can cause many clinical manifestations, including allergic reactions of varying degrees. Most people develop only minor local reactions. Exaggerated redness and swelling at the site of the sting gradually enlarges over 1–2 days and resolves within several days. These reactions are usually mild and transient, although large local reactions or systemic allergic reactions (e.g. urticaria, anaphylaxis) may develop in some patients as in the acute phase

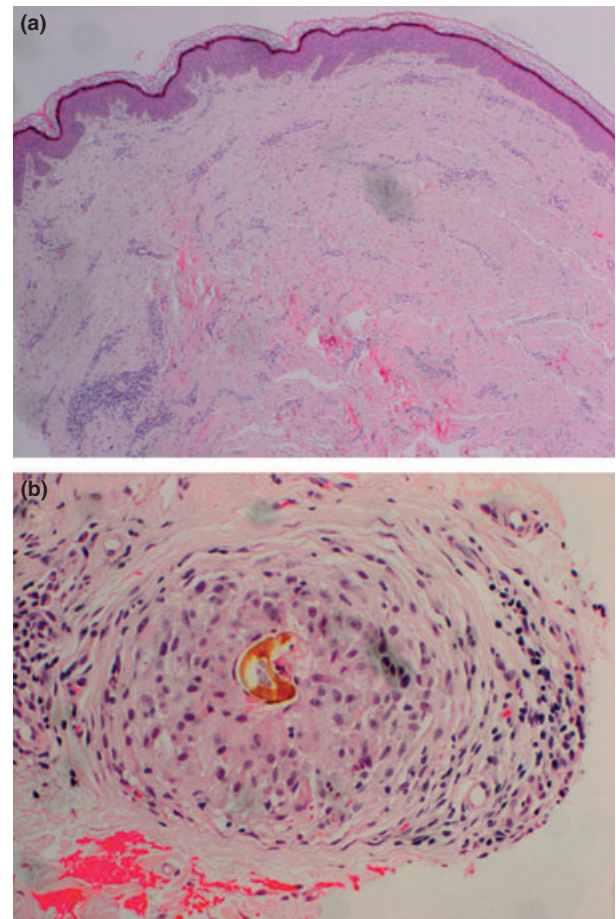


Figure 4 (a) Normal epidermis and inflammatory cell infiltration in dermis (H&E, $\times 40$). (b) Well-circumscribed foreign body granuloma consisting of yellow material and surrounding histiocytes and some giant cells in the dermis (H&E, $\times 200$)

of live bee acupuncture dermatitis. The cases of Yoo *et al.*⁴ and Song *et al.*⁶ were classified as an acute stage. Urticaria and anaphylaxis had developed in the cases of Yoo *et al.*⁴ and Song *et al.*,⁶ respectively.

The subacute stage can develop from multiple live bee acupuncture therapy, which induces the accumulation of bee venom in the patient's tissues. Only one case was regarded as in the subacute stage. The patient had an ulcerative tumor with an elevated, granulating base and multiple abscesses covering hemorrhagic exudates. Histopathological examination revealed massive lymphocytes, eosinophils, sparse histiocyte infiltrations, and flame figures but no distinct granulomas in the dermis. In the first case, we noticed interesting histopathological findings, such as flame figures and some debris judged to be those of bee stingers. Flame figures were first described in eosinophilic cellulitis (Wells syndrome)⁷ and were later found in a variety of dermatoses, such as bullous pemphigoid,

eczema, tinea,⁷ urticaria,⁸ molluscum contagiosum,⁹ and arthropod bite reaction.¹⁰ The flame figures might be a histological response to various factors that stimulate release of eosinophils.

Various studies have reported that the release of major basic protein from eosinophils results in tissue injury such as necrobiosis, followed later by infiltration of phagocytic histiocytes and giant cells around flame figures in the old lesion.^{7,11} For these reasons, we have concluded that the flame figures seen in the first case resulted from an allergic reaction to the massive bee venom from the multiple live bee acupuncture therapies and predominantly eosinophilic infiltration induced by a hypersensitivity reaction. Because no prominent histiocytes were found around the flame figures, the disease appeared to be in the subacute phase and was so classified. We think that the small number of cases in the subacute stage is due to two factors. One is that most patients visit the hospital in the chronic phase because live bee acupuncture therapy is usually stopped at the point of transition from the acute phase to the subacute phase, at which time the *Myeong-Hyun* phenomenon appears, so accumulation of the bee venom is insufficient to display the characteristics of the subacute phase. In this situation, the lesion may evolve to the chronic stage directly without passing through the subacute stage. The other reason most patients visit the hospital in the chronic phase is that they might distrust modern medicine and ignore the signs and symptoms of the *Myeong-Hyun* phenomenon.

In the chronic phase, patients may have symptoms varying from erythematous papules, patches, and subcutaneous nodules to ulcerative tumors and atrophic plaque. Most cases we reviewed were judged to be in the chronic stage, with the duration of illness continuing for 2–3 years. Histological examination revealed inflammatory cell infiltration, such as lymphocytes, eosinophils, and histiocytes, and giant cell infiltration with granuloma formation in the dermis. Foreign body granulomas, especially, were found in all cases (Table 1). These results bear out the theory that the barbed stinging apparatus and venom sacs, along with a nerve plexus, can lodge in the victim's skin after a bee sting.^{3,12} In live bee acupuncture therapy, most patients intentionally leave the venom sac in the tissue, in contrast to removing it as in accidental bee stings, because they consider it to be therapeutic. That is why most cases of live bee acupuncture dermatitis are found in the chronic stage. In view of the fact that some histiocytes and multinucleated giant cells were found around the site of live bee acupuncture therapy, we suggest that mature granulomas can develop if the patient suffers from the chronic phase of the disease. Our second case and those of Yu *et al.*,¹ Park *et al.*,² and Bae *et al.*⁵ were classified in the chronic stage.

We believe that live bee acupuncture therapy can cause various clinicopathological responses according to the amount of venom, frequency of application, and duration of treatment, and that the initial, or acute, adverse reaction of live bee acupuncture dermatitis is an inflammatory reaction, such as anaphylaxis or urticaria. In this situation, a foreign body granuloma can develop in the chronic state from the remaining stingers, similar to that of a bee sting reaction. However, unlike bee stings, live bee acupuncture therapy can be applied multiple times, possibly increasing the eosinophilic stimulation by the venom. This occurs frequently in Korea, where side effects might be considered as a *Myeong-Hyun* phenomenon, prompting the patient to persist in continuing treatment. This was also seen in the first case, in which the characteristic histological feature such as flame figures occurred as a result of eosinophilic stimulation. We considered that this subacute phase was a characteristic feature of live bee acupuncture dermatitis, which is different from the adverse skin reaction induced by an accidental bee sting.

Conclusion

We have presented two interesting cases caused by excessive bee venom exposure and bee stinger due to multiple live bee acupuncture therapies. We classified live bee acupuncture dermatitis into three stages according to pathological findings. In the subacute stage, unlike bee stings, we see the characteristic histological flame figures. We consider this subacute phase as a characteristic feature of live bee acupuncture dermatitis that is different from the adverse skin reaction of accidental bee sting.

We suggest that these disease entities be called live bee acupuncture dermatitis as an endemic variant of adverse bee sting reactions. We hope that this article will contribute to the knowledge about the dual nature of live bee acupuncture therapy with bee venom and bee stingers.

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