Review Article

The Koebner Phenomenon in Sarcoidosis

Hiroaki UEKI

Kawasaki Medical School :
577 Matsushima, Kurashiki, Okayama, 701-0192 Japan

ABSTRACT. The isomorphic response of Koebner can be observed not only in psoriasis, but also in several diseases including lichen planus, vitiligo vulgaris, and further in systemic diseases; such as in SLE (systemic lupus erythematosus) or sarcoidosis.

Some important clinical findings in sarcoidosis are presented and discussed in this paper with special references to Koebner phenomenon. Several intriguining examples; such as mutual-, microscopical-, internal-, or intra-lesional- Koebner phenomena are introduced and presented with related cases and figures.

As the pathophysiology of Koebner phenomenon, it could be speculated that the 1st step of non-specific inflammations locally induced by some environmental stimuli to the normal-appearing skin including trauma, heat, cold, sun exposure, metal, tattoo, dermatitis, infections, etc might be followed by the 2nd step of the disease-specific reactions based upon genetic, immunologic or inflammatory backgrounds after latent periods.

The understanding and investigation of these Koebner phenomena are important to clarify the natures of sarcoidosis of unknown etiology.

Key words ① **Sarcoidosis** ② **Koebner phenomenon**
③ **Mutual Koebner phenomenon**
④ **Microscopical Koebner phenomenon**
⑤ **Internal Koebner phenomenon**

Koebner phenomenon in sarcoidosis with special consideration of clinical findings.

Sarcoidosis is a chronic systemic non-caseative epithelioid granulomatosis of unknown nature. Cutaneous sarcoidosis can be a good model to understand its pathophysiology. The isomorphic response of Koebner was originally found in psoriatic skin by Prof. Heinlich Köbner[1] in Breslau in 1876, who described the newly-appearing psoriatic lesion on the normal healthy skin after horse-bites. He observed further that this phenomenon could be provoked by puncturing the normal-appearing skin in psoriatic patients after certain latent periods (3 weeks to several months).

This phenomenon was confirmed not only in psoriasis but also in lichen planus, vitiligo vulgaris, and autoimmune blistering dermatoses, and has been accepted as the "Köbner Phänomen" (Koebner phenomenon) or isomorphic response[2)~6)]. This Koebner phenomenon has been further reported also in various systemic

植木宏明：学長
e-mail:hueki@med.kawasaki-m.ac.jp

fundamentally differs from immediate immune reaction (type Ⅰ immune reaction) and even from the tuberculin reaction (type Ⅳ reaction), Mitsuda reaction (type Ⅳ reaction), and Arthus reaction (type Ⅲ reaction). What we observe here is the total sarcoidosis lesion consisting of macroscopic and microscopic reactions. There are total histological reactions in the Kveim reaction-positive site, and analysis of infiltrated lymphocytes demonstrated the presence of oligoclonal Vβ-specific T cells[40], indicating that the involvement of immunoreaction cannot be excluded. The Koebner reaction is the specific disease itself generated after a certain latent period irrespective of provocations, such as injection or trauma, and it is important that the similar reactions as the primary step are induced in sarcoidosis, psoriasis, lichen planus, lupus erythematosus, and leucoderma vulgaris after individual stimulation. Interestingly, most diseases causing the Koebner phenomenon are accompanied by autoimmune phenomena. In addition, as described in the former chapters, if the reactions of the second step would target the inflammatory products of the first step, these continuous reactions may be usually occurring within the chronic lesions of sarcoidosis. Within these chronic lesions, there are always the mixed reactions of the non-specific inflammations of the first step and the disease-specific inflammations of the second step. Thus, the non-specific and the specific inflammatory reactions would be inter-acted each others continuously. This phenomenon can be recognized and understood as the intra-lesional Koebner phenomenon.

CONCLUSIONS

It is difficult to clarify the pathophysiology of diseases of unknown causes, such as sarcoidosis, even with the most recent findings, if detailed informations from the clinical fields are not used. As dermatologists have the advantage of observing lesions directly and macroscopically, it is considered necessary to understand the dynamics and characteristics of lesions and to observe lesions in other organs. Dermatologists can observe the Koebner phenomenon clinically, and informations about environmental factors involved in the skin surface and stimulation to the oral and genital mucosa obtained from the patients is very useful. For example, false dentures as a stimulus to the oral mucosa, autochewing, and autolicking of the lips are often observed. Under careful questioning from the physician, patients often recognize their habits. Since there are diseases which can be understood only by expanding the view from local area to the systemic organs, cooperation with physicians of other clinical fields should be developed. On the basis of such cooperation, it may be possible to accumulate effective evidences. The knowledge and understanding of the Koebner phenomenon in sarcoidosis may be useful and productive for clarification of its patho-mechanism, and also for the management and/or treatment of sarcoidosis.

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