

Solitary Keratoacanthoma Developing on an Acupuncture Site

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A 61-year-old woman, who had been treated by acupuncture on the glabellar region due to frontal headache ten days ago, had a rapidly growing tumor on that region. Histopathologically, the tumor was shown to be a central crater filled with eosinophilic keratin & a marginal buttress formed by invagination of the epidermis. According to clinical & histopathological findings, we can easily diagnose our case as solitary keratoacanthoma. As shown in our case, we think that acupuncture should be counted as one of the causative factors in the development of solitary keratoacanthoma. (*Ann Dermatol* 5:(1) 64-68, 1993)

Key Words: Solitary keratoacanthoma, Acupuncture

The solitary keratoacanthoma (KA) is a common, rapidly growing, benign tumor with a natural history of spontaneous involution which was first described by Hutchinson in 1889¹. The etiology of KA is uncertain, but it has been associated with many exogenous factors, including sun exposure, chemical carcinogens, trauma or preexisting skin lesions, genetic factors and viral infections². In the literature, many described the occurrence of KA following various types of mechanical trauma such as a squeezed boil, mosquito bite, razor cut & a squeezed spot². The most interesting feature of this disease is the rapid growth for some two to six weeks, which is followed by a stationary period for another two to six weeks, and finally a spontaneous involution for another two to six weeks leaving a slightly depressed scar³. The following case report presents a patient who has developed solitary KA on the acupuncture site for ten days.

REPORT OF A CASE

A 61-year-old woman visited our department because of a rapidly growing tumor on the glabellar region. By taking her history she had been acupunctured at the site due to frontal headache 10 days ago. Also she had a pemphigus vulgaris which had been treated with triamcinolone & dapsone for 6 months. On skin examination, there was a tumor on the glabellar region, which approximately 0.8×0.8cm in size, well-circumscribed, hemi-spheric, and dome-shaped with a central crater filled with keratinous materials (Fig. 1).

The clinical differential diagnosis included KA, squamous cell carcinoma (SCC), cutaneous horn, verruca vulgaris, and pseudoepitheliomatous hyperplasia. But we were able to suspect this tumor would be a KA by its far faster growth and by its typical central core of keratin. Under local anesthesia the tumor was removed by electrodesiccation following a shave biopsy and submitted for histological examination.

The histological examination showed a central crater filled with eosinophilic keratin (Fig. 2). Over the sides of the crater, which seemed to be formed by invagination of the epidermis, a "lip" or "mar-

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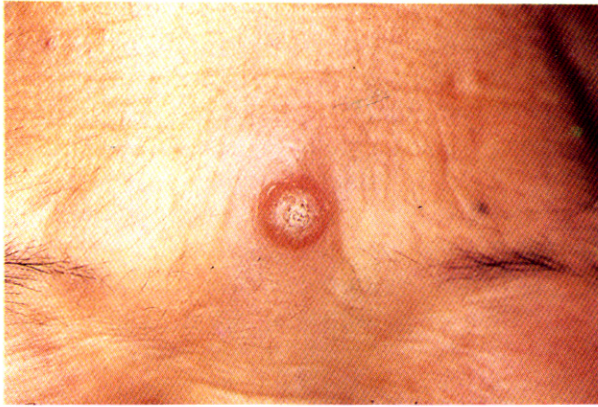


Fig. 1. Asymptomatic, solitary, 0.8x0.8cm sized, well circumscribed, hemispheric, and dome-shaped tumor with central crater.

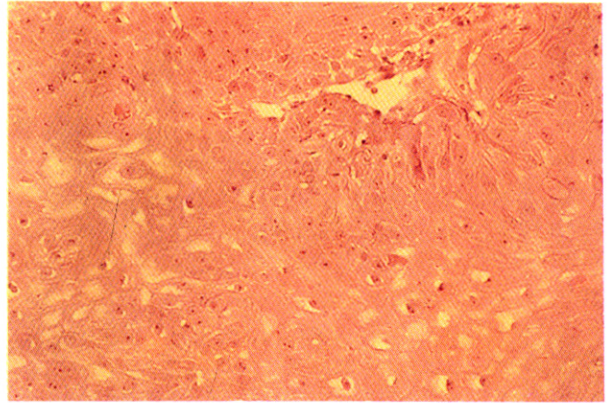


Fig. 4. The individual epidermal cells are highly keratinized and have an eosinophilic and glassy cytoplasm (H & E stain, $\times 200$).

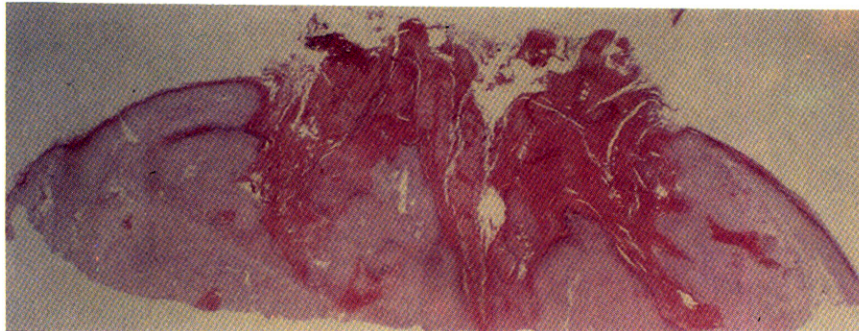


Fig. 2. A central crater filled with eosinophilic keratin (H & E stain, $\times 10$).

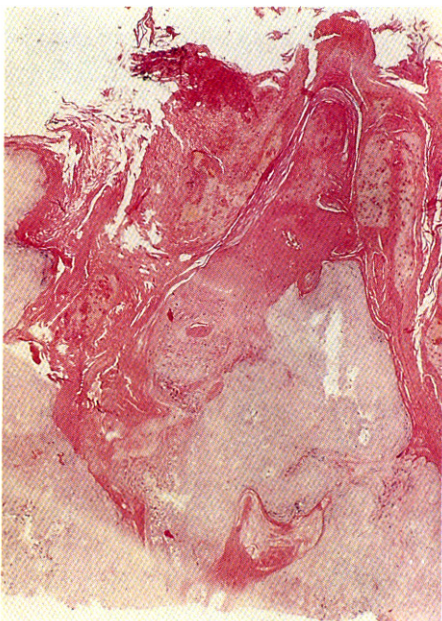


Fig. 5. Postoperative follow-up photo after 3 months shows no evidence of recurrence.

Fig. 3. A lip or marginal buttress of epithelium extended over the keratin-filled crater (H & E stain, $\times 40$).

ginal buttress" of epithelium extended over the keratin-filled crater (Fig. 3). At the base and sides of the crater, acanthosis in the form pseudoepitheliomatous hyperplasia occurred. The individual epidermal cells were highly keratinized and had an eosinophilic, glassy cytoplasm. However, the epidermal cells showed little atypia, mitoses, or dyskeratosis (Fig. 4). All of these pathologic findings were consistent with KA.

Postoperative follow-up examination of the patient after 3 months showed no evidence of recurrence (Fig. 5).

DISCUSSION

KA is a common, benign cutaneous tumor that is believed to arise from the hair follicles⁴. Bear and Kopf⁵ have classified KA into three types: solitary, multiple, and eruptive. Solitary KA is a rapidly growing papule, which enlarges from a 1 mm macule or papule to as much as 25mm in two to eight weeks. When fully developed it is a hemispheric, dome-shaped, skin-colored nodule in which there is a smooth crater filled with a central keratin plug. It occurs mostly on sun-exposed skin, with the central portion of the face, the backs of the hands, and the arms being the most commonly involved sites. It is seen mostly in middle-aged elderly persons with men being more frequently involved³. Following the phase of evolution, the lesion remains quiescent for two to eight weeks and then begins to regress spontaneously. During this regressive phase the tumor mass gradually shrinks, the keratinous plug is expelled, and ultimately the lesion heals with a thin puckered scar. The total duration of the lesion is usually two to eight months⁶. In our case, the duration of evolution is as short as about ten days. It is not surprising because the lesion of our patient is not a fully developed but a developing state.

Histologic criteria of KA include the presence of mitoses only in the outermost layer, growth not deeper than the sweat coils, a relatively normal nuclear-cytoplasmic ratio, absence of dyskeratosis, and mainly orthokeratotic maturation of the central cells⁷. But, practically the histopathologic findings of KA and a low-grade SCC are frequently so similar that it is often difficult to make

a definite diagnosis on the histologic findings alone. In our case, the KA is clinically distinguished from SCC by its far faster growth and by its typical central core of keratin which is usually absent in SCC. Furthermore, histopathologic findings are consistent with typical KA and there was no evidence of malignancy. Recently, Smoller *et al*⁸ have used the immunohistochemical stain for involucrin, as a diagnostic aid in differentiating these tumors.

The treatment of KA is usually approached with the view that the lesion will regress spontaneously. Nevertheless, there are important reasons why these lesions should be treated. The difficulty of deciding clinically between KA and SCC may dictate an excisional biopsy. Therefore the treatment of choice is usually simple complete excision. Other methods of treatment have included curettage with electrodesiccation for small lesions and intralesional injection of 5-fluorouracil for larger lesions⁶. In our patient, the tumor was removed by electrodesiccation following a shave biopsy. There is no evidence of recurrence so far, about three months later.

The cause of KA remains unknown but many causative factors have been proposed. Belisario⁹ indicated that sunlight plays an important role in the etiology, especially in the solitary type. The high index of sunlight exposure to the incidence of KA is closely correlated. In addition, light-skinned persons are more apt to develop KA than dark-skinned persons. Chemical carcinogens were believed responsible for some KA because the tumor is observed in both sunny and smoky industrial towns². The role of pitch and tar (carcinogenic agents) in the production of KA in the industrial workers is well established and the tumor has been produced in rabbits, mice, rats, hamsters, hedgehogs, chickens, and ducks by painting the skin with various chemical carcinogens⁴. There is a statistically significant higher incidence of KA in smokers than in nonsmokers². It has been suggested that genetic factors may be involved in the production of certain types of multiple KA, for family members are at times also affected by this disease¹⁰. In cases of a solitary tumor such a family background has not been recorded. Human papilloma virus has recently been impunged³. Several European

reports have described the detection of human papilloma virus in KA^{11,12}. The administration of immunosuppressive drugs may not only be associated with the development of KA, but may also be associated with the transformation of KA into aggressive squamous cell carcinoma⁶. Many reports have suggested an association of KA with internal malignancies. Many appear to be coincidental, and Kingman et al¹³ found no increase in internal malignancies in their 90 cases. Two situations may occur when there is an association. But they found 21 per cent of their 90 patients had associated basal cell or squamous cell carcinomas. In the literature, many reports describe KA following various types of mechanical trauma or secondary to other skin lesions such as eczema, seborrheic dermatitis, and psoriasis¹⁴. Kopf and Andrade¹⁵ have cited instances of KAs seemingly arising from inoculation or as an isomorphic phenomenon. Ghadially et al and Kingman et al reported approximately 10 per cent of lesions to have developed in areas of injury or previous skin diseases^{2,13}. Some cases that illustrate this point are listed in table 1. Are such occurrences fortuitous or is there evidence of a causal mechanism? It seems that the very fact that many of these tumors arise at or close to the site of injury and not elsewhere on the skin suggests strongly that a causal rather than a fortuitous relationship exists between the two events. On the other hand, trauma to human skin is frequent but this is rarely followed by a tumor. Numerous workers have shown that animal skin pretreated with one or more applications of a carcinogen and then subjected to one of many apparently non-specific stimuli such as mechanical trauma or chemical irritation, develops tumors. It is therefore conceivable that if human skin rendered susceptible to tumor formation by genetic and or carcinogenic

factors is subjected to trauma or becomes the site of diseases in which epithelial proliferation occurs, KAs are likely to be produced. In our case, a scrupulous history taking revealed a causal relationship between acupuncture and the evolution of KA. Another causative factor such as a medical history of long term use of triamcinolone and dapsone could be indirectly involved, but, if any, this possibility was rare because immunosuppressive treatments usually predispose patients to the multiple and eruptive form of, or more frequent and recurrent KA. Also, the previous skin lesions of pemphigus vulgaris could developed into the KA. According to her memory, the glabellar region had been spared by pemphigus vulgaris. In addition, the actinic factor could not entirely be excluded. But, in fact, it seemed to be an ambiguous problem.

In Korean literature, we reviewed KAs and their sites and causative factors (Table 2)^{1,16-18}. But, among them there are no known cases having had

Table 1. Keratoacanthoma following trauma and other lesions*

Tumor site	Trauma and associated lesion history	Contact
Nose	Squeezed boil	None
Nose	Mosquito bite	Machine oil
Outer canthus	Razor cut	Unknown
Nose	Recurrent cold sores	Tar
Nose	Squeezed septic spot	None
Neck	Squeezed blackhead	None
Temple	Comb injury	Unknown
Upper lip	Dermatitis, razor cut	Tar
Cheek	Eczema, burn 1 week previously	Unknown
Forehead	Squeeze spot	None

*: Cited from Ref. 2

Table 2. Review of solitary keratoacanthomas in Korean literature

Report	Sex/Age	Site	Predisposing factors
Kim et al ¹⁶	F/48	Lt. upper cheek	Unknown
Han et al ¹	F/66 M/44	Mons pubis Forehead	Unknown Unknown
Park et al ¹⁷	M/35	Lt. nasal vestibule	Verruca vulgaris
Kang et al ¹⁸	F/56	Labial mucosa	Sun-exposure

a history of specific trauma. Perhaps it can be ascribed to some careless history. In future it is necessary to investigate the causative factors, if possible, once the diagnosis of KA is confirmed both clinically and histopathologically. In conclusion, as shown in our case, we think that acupuncture should be counted as one of the causative factors in the development of KA.

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