

Reactive Keratoacanthoma Responding to Excision and Healing by Secondary Intention

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Abstract

Keratoacanthomas (KA) are rapidly-growing tumors of uncertain etiology. KAs mimic squamous-cell carcinoma (SCC) histologically but have the capacity to regress spontaneously or, rarely, progress to metastatic SCC. KA recurrence has been noted following complete excision and destructive treatment modalities. The term “reactive KA” has been used in this setting. We report three cases of reactive KAs that responded to excision and healing with secondary intention.

Introduction

While the pathogenesis of keratoacanthoma (KA) development is debated and likely multifactorial, KA formation at sites of cutaneous trauma are well-documented in the literature.¹ The term “reactive KA” has been used in this setting. In reviewing the literature, the time from treatment to appearance of reactive KA ranges from two weeks to six months, with a mean of two months.¹⁻⁵ Most patients are elderly, with a mean age of 80, and most reactive KAs occur on exposed areas of the extremities.¹⁻⁵ We report three cases of reactive KA effectively treated with surgical excision utilizing minimal cutaneous trauma.

Case 1

A 57-year-old woman with a history of numerous SCCs on the bilateral dorsal forearms presented for evaluation of two hyperkeratotic nodules on the right forearm (**Figure 1A**). Biopsies confirmed well-differentiated SCCs (**Figure 1B**). Both were completely excised, and the defects closed primarily. She returned five weeks later for evaluation of hyperkeratotic plaques involving both previous excision scars and a new nodule on the mid forearm. Biopsy of all three lesions

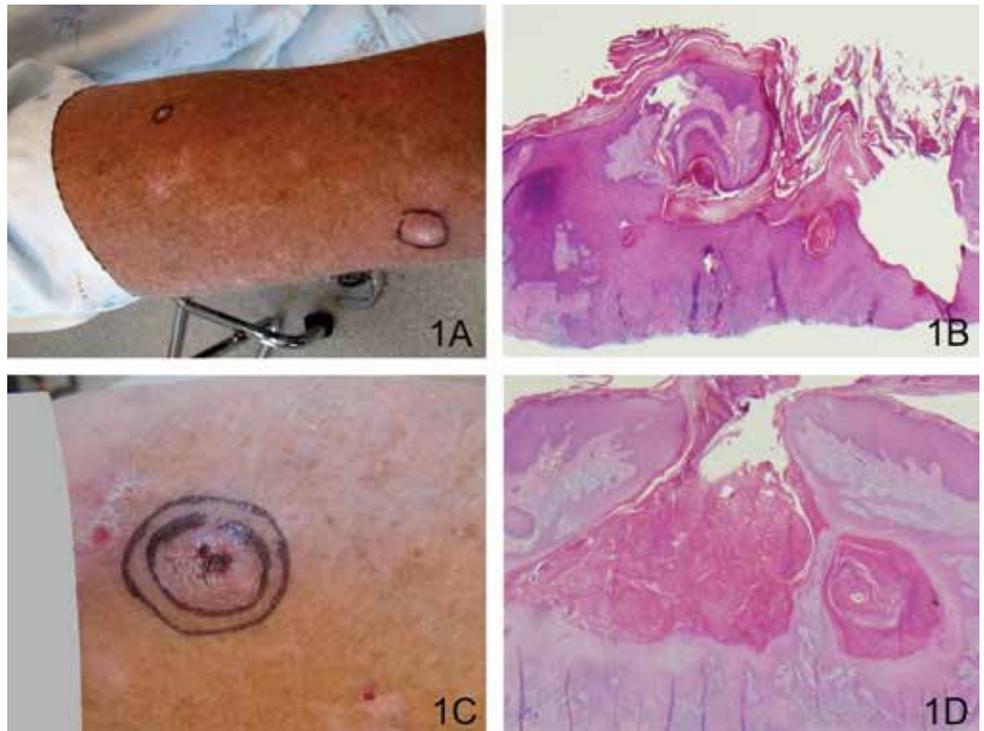


Figure 1. (A) Two hyperkeratotic nodules, right forearm. (B) Exo-endophytic crateriform atypical squamous proliferation with central keratin debris and features suggestive of arising from infundibular portion of hair follicle. Interpreted as SCC extending to biopsy base (H&E, 2x magnification). (C) Reactive KA within excision scar. (D) Re-excision with crateriform atypical squamous proliferation with central keratin debris appearing to arise from infundibular portion of hair follicle. Features typical of classic keratoacanthoma toward periphery (H&E, 2x).



Figure 2. (A) Shave with excoriation and features of lichen simplex chronicus with tongues and lobules of atypical keratinocytes extending to biopsy base (H&E, 4x). (B) Lesions treated with IL bleomycin or triamcinolone. (C) No recurrence at follow-up.



Figure 3. (A) Recurrent SCC on left elbow. (B) Reactive KAs within excision scar. (C) Re-excision of squamous proliferation with histologic features suggestive of KA arising in infundibular portion of pilosebaceous unit (H&E, 2x).

showed well-differentiated SCC. The largest lesion was re-excised and closed primarily.

She returned five weeks later for treatment of the remaining SCCs, and a new nodule was noted in the recent re-excision scar (Figure 1C). Reactive KAs were suspected, and all three lesions on the right forearm were excised and left to heal by secondary intention. Histology confirmed well-differentiated SCC with clear surgical margins (Figure 1D). The patient returned four weeks later with three new hyperkeratotic nodules involving the remainder of the scar on the right lower forearm. Histology revealed excoriated atypical squamous proliferations (Figure 2A). All three nodules were treated with 0.2 cc intralesional bleomycin (1 unit/cc). Additional nodules developing in previous saucerization scars were biopsied and found to represent hypertrophic scars, which were injected with IL triamcinolone (Figure 2B). The patient has shown no evidence of recurrence after four months of follow-up (Figure 2C).

Case 2

An 81-year-old man presented for re-excision of a recurrent SCC on the left elbow (Figure 3A). The lesion had been previously excised three times over an eight-month period. The SCC was removed with two stages of Mohs micrographic surgery (MMS), and the defect was closed primarily. The patient returned four weeks later with two hyperkeratotic nodules within the excision scar (Figure 3B). Biopsy revealed a squamous proliferation with features of KA (Figure 3C). Reactive KA was suspected, and the nodules were excised utilizing minimal electrocautery and the defect left to heal by secondary intention. There has been no evidence of recurrence after 18 months of follow-up.

Case 3

A 76-year-old woman presented with a rapidly-enlarging nodule on the left upper pre-tibia. She had a history of two previous SCCs excised from

that leg without complication. Biopsy revealed SCC. The lesion was excised with one stage of MMS and repaired with primary closure. Four months later she returned with a nodule developing in the center of the scar (Figure 4A). Biopsy showed an invasive, well-differentiated SCC (Figure 4B). Reactive KA was suspected, and the lesion was excised with the defect allowed to heal by secondary intention. One vein was ligated with 4-0 polyglactin 910 suture, and no electrodesiccation was used. There has been no evidence of recurrence after six months of follow-up.

Discussion

The pathogenesis of KA development is likely multifactorial. Genetic predisposition, immunosuppression, ultraviolet (UV) radiation, chemical carcinogens, and viral infections have all been implicated.¹ KA formation at sites of thermal burns, laser resurfacing, chemical peels, skin graft donor sites, and other forms of cutaneous trauma has been documented.¹ KA recurrence following routine surgical excision occurs at a rate of 4% to 8%, though this does not appear to denote increased malignant behavior.^{2,3} Brisk KA recurrence has been documented following histologically confirmed complete excision and MMS.⁴ The term “reactive KA”

has been used in this setting. In reviewing the literature, the time from treatment to appearance of reactive KA ranges from two weeks to six months, with a mean of two months.¹⁻⁵ Most patients are elderly, with a mean age of 80, and most reactive KAs occur on exposed areas of the extremities.¹⁻⁵

Distinguishing between a recurrent, incompletely excised SCC and a reactive KA is a subject of debate. A true recurrence would be expected to develop in the most central aspect of a scar. Some of the lesions we encountered occurred on the lateral aspect of excision scars, which suggests the lesions were instead reactive in nature. Additionally, the rapid timing of recurrence supports this etiology.

The dilemma is further compounded by indistinct histologic features.^{2,5} It is not possible to distinguish reactive KAs histologically. A well-differentiated SCC with endophytic or crateriform features mimics KA both in architecture and sometimes in cytology with the classic description of keratinocytes at the periphery exhibiting glassy eosinophilic cytoplasm.² However, most reactive KAs seem to have the helpful feature of being associated with the infundibular portion of one or more hair follicles.² KAs are thought to arise from

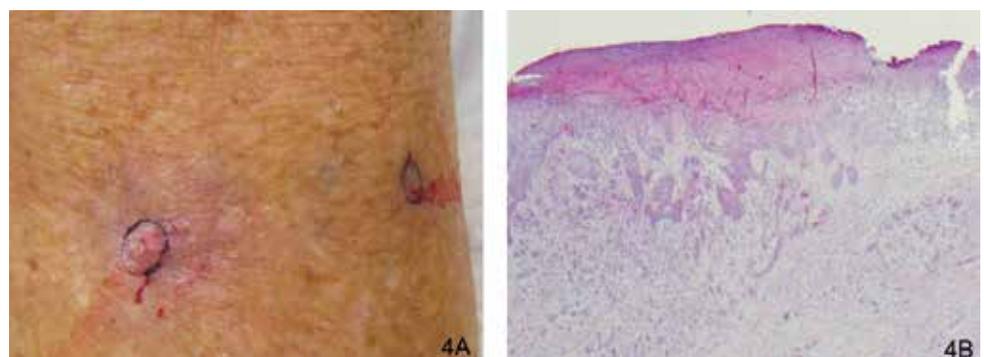


Figure 4. (A) Reactive KA within excision scar. (B) Re-excision with shallow ulcer overlying invasive SCC associated with fibrosing granulation tissue consistent with prior biopsy site (H&E, 4x).

follicular infundibula in hair-bearing (most often exposed) skin.² It is also possible that although the natural history of a KA results in spontaneous involution, a bona fide SCC might arise within a lesion of KA.³

It has been proposed that surgical trauma, including the use of electrodesiccation and placement of sutures, can contribute to the formation of reactive KAs, possibly representing a form of Koebner phenomenon.⁵ Minimizing surgical trauma led to resolution of several recrudescing reactive KAs in our case series. Needle puncture sites should also be minimized during anesthesia administration.⁵

We report one patient who developed several lesions that responded to IL bleomycin. Intralesional 5-FU and methotrexate are other non-surgical treatment modalities that have been reported to be successful for reactive KAs.² Systemic retinoids such as acitretin have also been effective in maintaining lesion clearance.^{2,3} Destructive modalities such as electrodesiccation and curettage (ED&C) and external beam radiation have been associated with worsening of the condition.²

Conclusion

Early recognition of the reactive KA phenomenon is important in order to prevent disfigurement and morbidity to the patient. In our series, the reactive KAs were excised, and particular effort was made to minimize electrodesiccation and suture placement. This approach was effective for all lesions treated.

References

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