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Case Report

Post-traumatic keratoacanthoma of the hand: A case report

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ABSTRACT

A 59-year-old male working as a construction worker presented with an acute, rapidly growing dorsal hand mass after a direct, sharp penetrating injury to the hand. He was taken to the operating room for an excision biopsy and local flap coverage. Final pathology reports demonstrated well-differentiated squamous cell carcinoma, keratoacanthoma (KA) type. KA is common but has a varied presentation. The diagnosis and management are controversial but typical recommendations are wide excision for a tissue diagnosis and postoperative surveillance. Here, we present a rare report of an acute posttraumatic keratoacanthoma of the hand and a review of the literature.

Case report

The patient was a 59-year-old male without significant past medical, surgical, or family history who worked as a construction worker for the local city who sustained a work injury in which the sharp edge of a galvanized culvert penetrated the dorsum of his right hand causing a small subcentimeter laceration. Over the ensuing 6 weeks, he developed an enlarging painful mass. The patient presented to their primary care physician who thought he was developing a *Staphylococcus* abscess and urgently referred him to the hand surgery service on antibiotic therapy.

On examination, the patient had a solid, mobile, 2.5 cm × 2.0 cm dorsal mass of the right hand (Fig. 1). The mass was nonpulsatile, nonfriable, nonfluctuant, did not move with the underlying structures, and appeared to be limited to the cutaneous and subcutaneous tissues. There was no surrounding erythema or expressible drainage. The mass had a central area of keratinaceous-appearing material. The remainder of the examination was unremarkable, including lack of palpable lymphadenopathy. Radiographs were unremarkable. Routine laboratory values were unremarkable and within normal limits.

With the history of a local penetrating-type traumatic injury, the differential diagnosis was limited and included infection and epidermal or epidermoid inclusion cyst. However, the clinical examination was reassuring in terms of ruling out infection. With the appearance of a central area of keratinaceous-appearing debris and rapid enlargement, a keratoacanthoma was also considered. Given that the mass was mobile and nonadherent to the subcutaneous structures, advanced imaging was not felt to be warranted.

The patient subsequently underwent an excisional biopsy with wide margins and a rotational flap for coverage. On the day of surgery, the mass appeared to be larger than on presentation and the central area of keratinaceous material was more pronounced (Fig. 2). The mass did not extend into the deeper tissues, did not extend subfascially, and there were no neurovascular structures penetrating the substance of the mass itself. Intraoperative microscopic evaluation did not reveal any gross evidence of perineural invasion.

Final pathology confirmed a well-differentiated squamous cell carcinoma, keratoacanthoma-type, with negative margins. The flap healed without issue (Fig. 3). The patient was referred to a dermatologist for routine surveillance and at final follow up at 1 year had no

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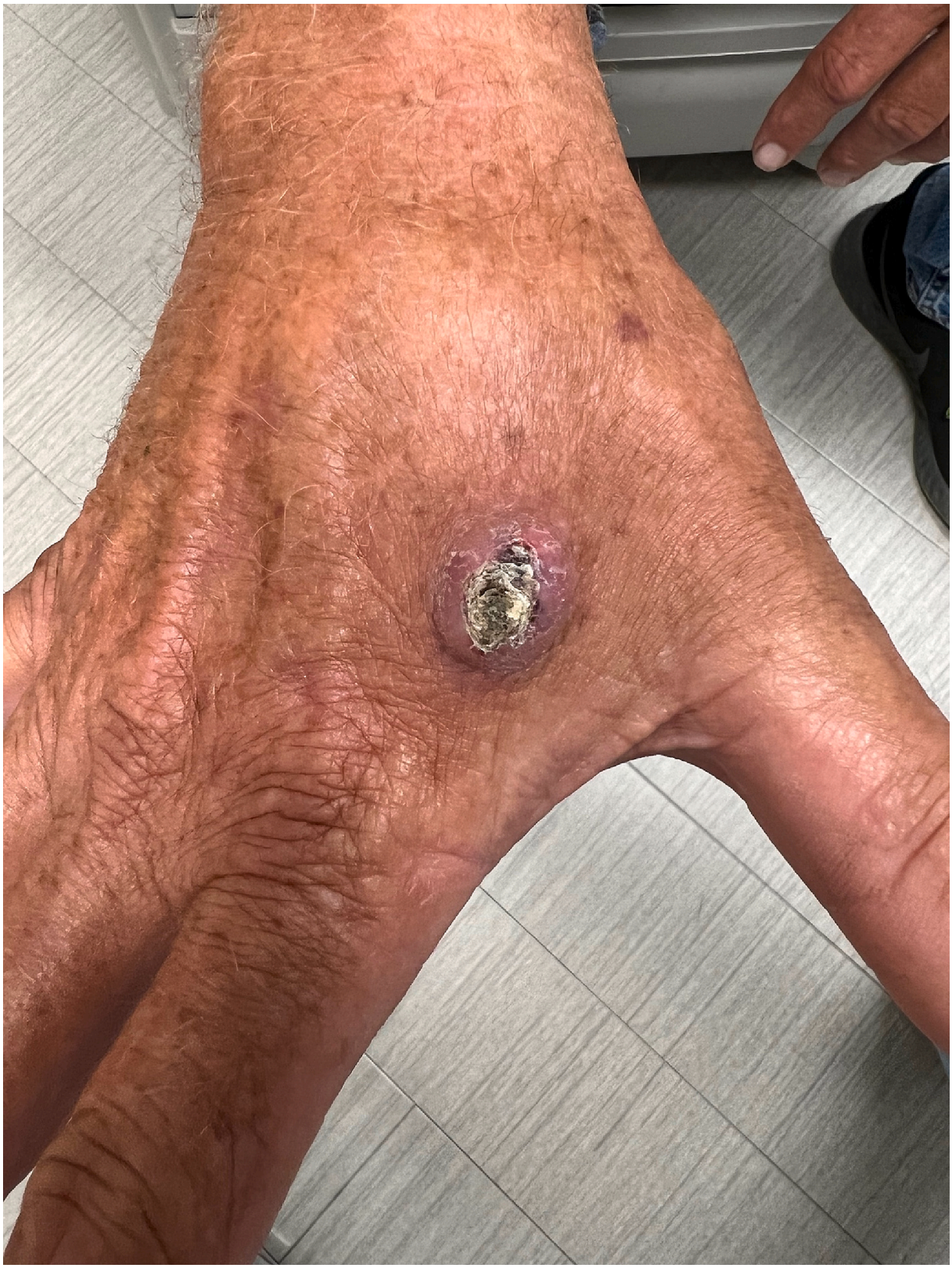

Fig. 1. The dorsal hand mass on the day of presentation, approximately 6 weeks after the patient's injury.

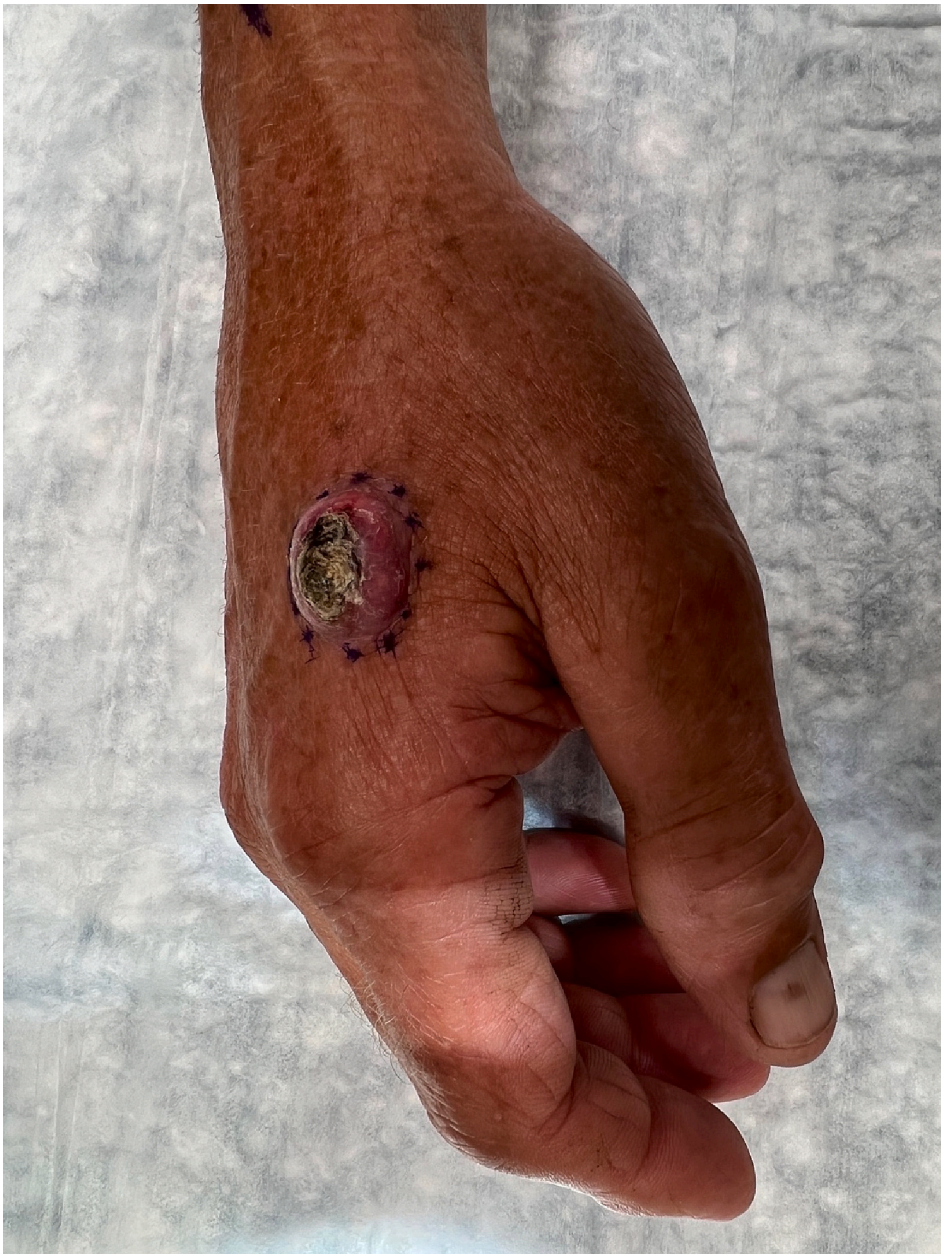

Fig. 2. The appearance of the mass on the day of surgery, approximately 10 days later.

evidence of local recurrence. No additional treatment was necessary.

Discussion

Keratoacanthoma (KA) are common skin lesions characterized by rapid growth followed by regression. Its classification as a type of squamous cell carcinoma, histopathology and diagnostic criteria, and treatment remain controversial [1]. Its epidemiology also lacks consistent consensus, given the varied diagnostic criteria and probable underreporting from likely spontaneous regression prior to diagnosis. The typical lesion, however, is a solitary sporadic KA approximately 1-2 cm in diameter in lighter-skinned individuals with a history of sun exposure. Males have a higher incidence of KA than females, and the usual age group is 50–69 years of age. There are a variety of types and presentations, including "giant" KA, multiple KA, subungual KA [2], and rare hereditary variants [1]. KA usually appear on the face, neck, and dorsal hands [3].

Risk factors for the development of KA are variable but typically involve the use of skin irritants, chemicals, immunomodulating

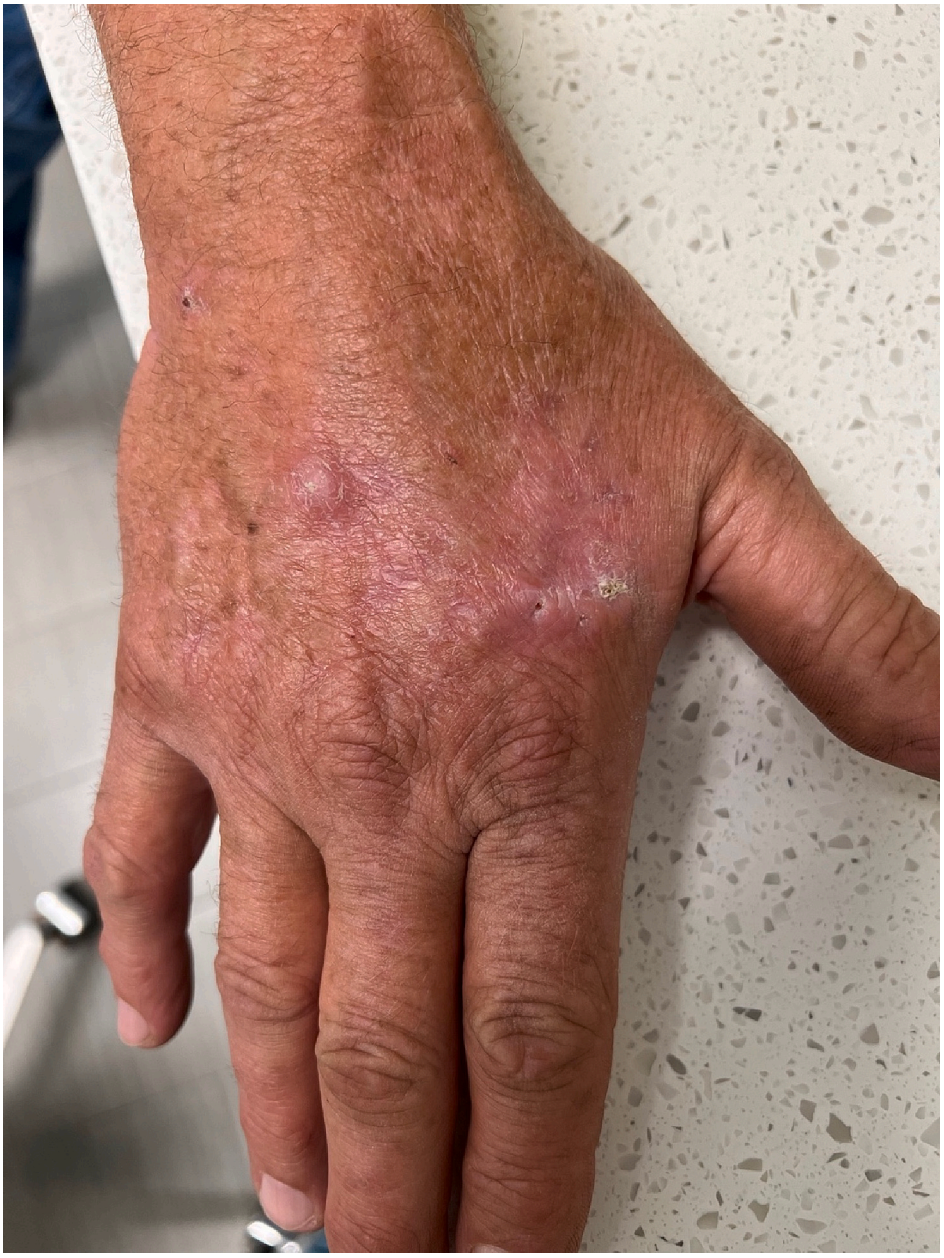

Fig. 3. The rotational flap has healed, approximately 6 weeks postoperative. Small areas of scarring and granulation tissue are visible on the dorsoulnar and dorsoradial hand, from the rotational flap.

drugs, radiation, and postsurgical. There have been multiple case reports of KA arising in the postoperative setting, such as from wound beds, skin grafts [4], graft donor sites, and even a bee sting [5].

Diagnosis is typically clinical and histological. Treatment remains controversial. Timing of regression is unpredictable, leaving the possibility of extensive scarring following a prolonged period of regression. While the potential for malignant transformation is low, and no fatalities have been reported from KA, establishing the correct diagnosis is of paramount importance, requiring adequate tissue sampling. There are no specific margins recommended for KA removal and positive margins usually do not portend recurrence [6]. However, the recurrence rate is between 1 and 8 % and dermatologic surveillance is recommended. A variety of topical and systemic medications are also available, especially when surgery is higher risk, and dermatologic consultation is advised [3].

KA can arise in the acute and chronic posttraumatic settings. Several cases [7,8] have been reported. One describes keratoacanthoma centrifugum marginatum (KCM) variants in the subacute and chronic posttraumatic setting, including the dorsum of the hand; however, the lesion arose 40 years after the patient's injury in the region of the scar [9]. In one review of 5 post-traumatic case reports, the time to development after injury ranged from 6 months to 40 years [7]. One report [10] describes a posttraumatic giant KA developing 3 months after an “infected trauma” to the dorsum of the hand. The patient underwent excision and splint thickness skin grafting of the greater than 5 cm lesion and had no recurrence at 4 years' follow up. The nature of the trauma was not reported. Another report describes a recurrent KA evolving into an extensive lesion involving bone and ultimately meriting ray resection. While this lesion arose near the area of a remote blowtorch burn 8 years prior, the description of the aggressive nature of the multiply recurrent disease with deeper bony involvement outside of subungual variants [2] is atypical and histopathologic diagnostic criteria may have changed since the report was published in 1990. Finally, a report [11] of a young 15-year-old male involved in a rollover motor vehicle collision who developed a KA arising from a hypertrophic scar details an excellent summary of reports of traumatic KA; most commonly, posttraumatic KA arose in the setting of blunt trauma to the upper extremities, and no reports of similar sharp penetrating trauma, as in our patient, were reported.

It is evident from the variety of case reports that there is no consensus on the use of “trauma” and “traumatic”, encompassing any insult to the skin, whether external (collision, e.g.) or iatrogenic (needlestick, e.g.), and a variety of injury mechanisms, whether abrasive, blunt, or penetrating. Our case we believe represents one of the few noniatrogenic, acute posttraumatic KA of the hand reported in the literature. We acknowledge that there may be limitations in this claim. The presentation of KA is varied and likely underreported, given its ability to spontaneously regress. Thus, it may be possible that there are cases of acute posttraumatic keratoacanthoma of the hand which have regressed prior to seeking medical attention.

Nonetheless, the hand, general, plastic, and dermatologic surgeon, as well as referring clinician alike, should be aware of the entity, diagnostic, and treatment modalities. Consensus is generally surgical excision to establish a tissue diagnosis, with postsurgical surveillance. Close consultation with a dermatologist is advised, who can assist in the appropriate treatment and surveillance.

Declaration of competing interest

None declared.

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