OASIS DERMATOLOGY GROUP

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Keratoacanthoma

Keratoacanthoma (KA) is a relatively common, benign epithelial neoplasm that primarily affects elderly individuals with fair skin, particularly those with a history of extensive sun exposure. Though typically self-limiting, KA shares many clinical and histological characteristics with squamous cell carcinoma (SCC), which complicates its diagnosis. In rare cases, multiple keratoacanthomas are associated with an underlying genetic condition known as Muir-Torre syndrome, which involves internal malignancies. Despite its benign nature, KA is often treated to avoid confusion with SCC and to prevent cosmetic complications such as scarring.

Epidemiology and Risk Factors

KA is most commonly observed in individuals aged 50-70 years, with a higher incidence in those with lighter skin types who have been subjected to significant sun exposure. The condition is more frequently found in areas that have been subjected to trauma or prior injury, with common sites of involvement including the face, hands, arms, and trunk. While KA itself is not linked to internal malignancies, the presence of multiple lesions may indicate a genetic predisposition, such as in Muir-Torre syndrome, a rare autosomal dominant disorder characterized by the occurrence of KA in conjunction with internal malignancies like colorectal cancer.

Clinical Features

KA typically presents as a rapidly growing, dome-shaped papule or nodule, often beginning as a small lesion (1-2 mm) that enlarges to 1-3 cm over a period of weeks. The lesion is usually smooth with a central keratin plug, which can be easily recognized during physical examination. The lesion generally progresses through several phases:

- ***Initial Growth Phase:*** The lesion enlarges rapidly, often over the course of 4-6 weeks, reaching its maximum size.
- ***Maturation and Stability:*** After the initial growth phase, KA typically becomes dormant for several weeks, during which the lesion does not increase in size.
- ***Spontaneous Regression:*** Over the course of 2-12 months, KA typically regresses spontaneously, frequently leaving behind scar tissue.

Although the benign nature of KA is well established, it can be difficult to differentiate from more aggressive tumors like SCC, necessitating clinical evaluation and sometimes biopsy.

Pathophysiology

The exact etiology of KA remains unclear, though it is believed to arise from the infundibular portion of the hair follicle. There is a hypothesis suggesting that KA may result from an abnormal proliferative response to sun damage or minor trauma. It has been proposed that KA could be

induced by genetic mutations that affect cell cycle regulation, leading to rapid, dysregulated keratinocyte proliferation.

Diagnosis

KA is primarily diagnosed based on clinical presentation. However, because its appearance can be similar to that of squamous cell carcinoma or other benign lesions such as basal cell carcinoma, biopsy and histopathological examination are often required to confirm the diagnosis. The key histological features of KA include a well-demarcated, cup-shaped lesion with central keratinization and a keratin plug. The lesion typically exhibits squamous differentiation with varying degrees of atypia. In contrast, SCC typically shows deeper invasion and more significant cellular atypia.

Treatment

Although KA is a self-limiting condition, it is commonly treated for diagnostic clarity and to avoid cosmetic concerns, as it can leave scarring after spontaneous regression. Several treatment options are available, depending on the size, location, and growth rate of the lesion, as well as patient preference.

- ***Surgical Excision:***
  - Surgical excision is the most definitive treatment for KA, especially for larger or persistently growing lesions. Excision is preferred for cosmetic reasons and for accurate diagnosis to rule out squamous cell carcinoma.
- ***Electrodesiccation and Curettage:***
  - Electrodesiccation and curettage are effective for smaller lesions. This approach allows for both removal of the lesion and management of the keratin plug. It is a commonly used technique for KA that provides a balance of effective removal with minimal scarring.
- ***Topical Treatments:***
  - *5-Fluorouracil (5-FU):* Topical application of 5-FU cream (usually applied three times a day for 1-6 weeks) has been shown to be an effective treatment for KA, especially for lesions that are not suitable for excision. It works by inhibiting DNA synthesis in proliferating cells, leading to the destruction of the keratinocytes within the lesion.
  - *Intralesional 5-Fluorouracil*: In cases where the KA is large or rapidly growing, intralesional injections of 5-FU have been reported to yield excellent results, especially in difficult-to-treat lesions.
- ***Other Medical Therapies:***
  - *Podophyllin Resin*: This topical agent has been used with success for the treatment of large or resistant KA. It acts by causing necrosis of the affected tissue.
  - *Methotrexate*: Intralesional methotrexate injections may also be effective for treating larger or more aggressive keratoacanthomas. Methotrexate, an antimetabolite, works by inhibiting cell division, thereby controlling lesion growth .

- *Radiotherapy*: This modality is sometimes employed for giant or refractory lesions but is generally considered a last resort due to the risk of long-term side effects such as radiation-induced skin damage.

➢ ***Systemic Therapies:***

- *Oral Isotretinoin:* For patients with multiple or recurrent KA, systemic treatment with oral isotretinoin may be beneficial. Isotretinoin, a retinoid, normalizes keratinization and decreases lesion formation.
- *Oral Acitretin:* Similar to isotretinoin, acitretin, another retinoid, has been used in patients with multiple or giant KA. Acitretin helps to regulate abnormal keratinocyte proliferation and can prevent the recurrence of lesions.

Prognosis and Long-Term Follow-Up

Keratoacanthomas generally have a good prognosis, particularly with appropriate treatment. Most lesions resolve with minimal sequelae, though scarring may occur due to spontaneous regression or surgical intervention. For individuals with multiple lesions or those associated with Muir-Torre syndrome, ongoing surveillance for internal malignancies is recommended. In most cases, KA does not recur after appropriate treatment, and the overall risk of transformation into malignant squamous cell carcinoma is minimal.

Conclusion

Keratoacanthoma is a benign, self-limiting skin tumor that often mimics squamous cell carcinoma, necessitating careful evaluation and sometimes treatment. While spontaneous regression is common, treatment is often pursued to prevent confusion with malignant lesions and to avoid scarring. Surgical excision, electrodesiccation, topical 5-fluorouracil, and systemic retinoids are among the most effective treatment options. Early intervention is key to ensuring optimal cosmetic and clinical outcomes for patients with this condition.

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