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(CASE REPORT)

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The use of the Kite Flap for Treating a Well-Differentiated Squamous Cell Carcinoma, Keratoacanthoma Type of the Thumb: A case report

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Abstract

Squamous Cell Carcinoma of the Keratoacanthoma type exhibits histopathological features of Keratoacanthoma but presents with malignant lesions.

Here, we describe the management of a well-differentiated squamous cell carcinoma on the dorsal aspect of the thumb using a kite flap.

This case report illustrates a rare diagnosis potentially encountered by hand surgeons and the possible use of a kite flap in a non-traumatic context.

At a 10-month follow-up, the patient showed favorable healing with stable, sensitive, and full coverage, and the satisfaction index was high.

Keywords: Kite-flap; Skin loss; Thumb; Squamous Cell Carcinoma; Keratoacanthoma

1. Introduction

Squamous Cell Carcinoma (SCC) is a malignant tumor arising from the epidermis or accessory keratinocytes. Its occurrence is closely linked to solar radiation, certain types of skin diseases, or precancerous conditions. It is a locally aggressive tumor that can also metastasize.

Keratoacanthoma (KA), also known as self-healing primary squamous cell carcinoma, is a rare benign tumor. It is more common in middle-aged and elderly men, primarily affecting sun-exposed areas.

SCC of the KA type exhibits histopathological features of KA but presents with malignant lesions.

Here, we describe the management of a well-differentiated squamous cell carcinoma on the dorsal aspect of the thumb using a kite flap.

The "kite" flap has revolutionized the coverage problem for simple and complex substance losses in the thumb. Mastery of the anatomical foundations and surgical technique is essential to perform this reliable and sensitive flap.

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2. Case observation

A 65-year-old patient, a chronic smoker with no other notable medical history, presented with a 3-cm papular, erythematous, and scaly lesion on the dorsal aspect of the metacarpophalangeal (MCP) joint of the right thumb for three years.

Figure 1 Initial papular, erythematous, and scaly lesion

Figure 2 Wide excision and coverage of the substance loss using a kite flap pedicled by the first dorsal intermetacarpal artery, with the donor site covered by a full-thickness skin graft from the arm

The patient initially consulted due to an increase in lesion size, prompting surgical excision of the lesion. Pathological examination revealed an exophytic and endophytic malpighian proliferation with a crateriform appearance filled with lamellar keratin and micro-abscesses. Tumor cells exhibited minimal atypia with abundant eosinophilic or glassy cytoplasm. The dermis showed fibro-edematous tissue with suspicious invasion foci surrounded by an inflammatory

infiltrate composed of lymphoplasmacytes, eosinophils, and neutrophils, alongside hyperplastic vessels. No vascular emboli or perineural invasion was observed. The proliferation reached the lateral and deep margins, concluding with a well-differentiated squamous cell carcinoma of keratoacanthoma type.

The excision was thus considered incomplete, leaving a residual tumor. The patient was referred to us for specialized care.

The extension workup showed no local or secondary extension. A multidisciplinary team recommended a surgical revision with wide excision. The procedure involved skin excision and coverage with a kite flap, with the donor site covered by a full-thickness skin graft harvested from the forearm.

Histological examination confirmed complete excision with no macroscopic or microscopic residual tumor (R0 resection).

At a 10-month follow-up, the patient showed favorable healing with stable, sensitive, and full coverage. The flap displayed satisfactory trophicity without graft adhesion. No complications at the donor site were noted, and the satisfaction index was high.

The Weber sensitivity test measured at 12 mm.

Figure 3 Foucher's kite flap with good results at a 10-month follow-up

3. Discussion

SCC of the KA type has histopathological characteristics of KA with malignant lesions. The keratin plug in the central depression is characteristic. Within lesion tissue, both KA and SCC may coexist with relatively indistinct boundaries.

Surgical excision is always the first choice in clinical practice for SCC of the KA type. If detected early, most lesions can be cured by surgical excision. However, when the tumor is extensive, skin flap transfer is required during surgical resection.

The kite flap design involves a sinuous skin incision along the artery, which originates at the angle between the first and second metacarpal bones. The aponeurosis of the first dorsal interosseous muscle is incised, allowing the pedicle to be mobilized with its fatty sheath by a meticulous dissection. The flap is elevated, preserving the perimysium of the extensor tendon, and rotated after subcutaneous tunnelization without tension. The rotation center corresponds to the first web space, enabling coverage of the thumb's distal part, ideal for dorsal surface coverage [1,8,9].

The donor site is immediately covered by a tension-free, full-thickness skin graft harvested from the medial arm or elbow crease [7].

We reviewed relevant literature. Y. El Andaloussi et al., W. Kim et al., and Adani et al. have reported successful cases using this flap with good outcomes. In our case, the kite flap option was determined by the preservation of the first dorsal intermetacarpal artery, achieving an aesthetically pleasing and functionally satisfactory result, without the hyperpigmentation commonly reported in other series: Tezcan M et al., El-Khatib HA, Yang JY. Our patient's index flexion and sensitivity were maintained without any adverse effects [4,5,6].

Our findings align with the literature. Notably, Braun's series of 79 cases reported five cases of index flexion limitation due to extensor tendon adhesions, three cases of partial necrosis, and three cases of total necrosis [7]; no such complications were observed in our case.

4. Conclusion

Surgical excision remains the first-line treatment for well-differentiated SCC of KA type. Early detection enables lesion cure through excision, but extensive tumors require skin flap transfer during resection.

Foucher's kite flap provides effective coverage for thumb substance losses. Familiarity with the first dorsal intermetacarpal artery anatomy and simple technical execution has popularized its use. The aesthetic and functional results in published series support its broader application.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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