



# Retention hyperkeratosis over surgical scar: case report and review of literature

Fares A. Alkhalayl<sup>1^</sup>, Loujain A. Alyousef<sup>2</sup>

<sup>1</sup>Dermatology and Dermatologic Surgery Department, Prince Sultan Military Medical City, Riyadh, Saudi Arabia; <sup>2</sup>College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

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*Correspondence to:* Fares A. Alkhalayl, MD. Dermatology and Dermatologic Surgery Department, Prince Sultan Military Medical City, Makkah Al Mukarramah Rd, As Sulimaniyah, Riyadh 12233, Saudi Arabia. Email: Falkhalayl@outlook.com.

**Background:** Retention hyperkeratosis (RHK) is benign and commonly seen skin condition in dermatology clinics. Hyperkeratosis refers to the increased thickness of the outermost layer of skin stratum corneum. RHK occurs when there is abnormality of routine desquamation that can be associated with poor hygiene. There are various types of hyperkeratosis, and could be divided according to their etiology. Although RHK is commonly recognized by dermatologists it is rarely reported. To the best of our knowledge, this is the first reported case of RHK over surgical scar.

**Case Description:** A 63-year-old male presented to our dermatology clinic with severe RHK over a midline sternotomy scar post-coronary artery bypass grafting (post-CABG) in which he developed over the past 8 years. Our patient's history was significant in avoiding touching the surgical area as he feared disturbing the healing process of his surgical wound. We discussed in details as further examination and investigations took a place on clinic-base during his management.

**Conclusions:** Since RHK is associated with poor hygiene as we have seen in our patient's case, it could be prevented by providing the patient instructions regarding his wound care and general hygiene postoperatively and management of hyperkeratosis differs depending on type, severity, and chronicity. Our case represents a rare extreme manifestation related to the fear of our patient cleaning surgical wounds.

**Keywords:** Retention hyperkeratosis (RHK); scar; wound care; hygiene; case report

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## Introduction

Retention hyperkeratosis (RHK) is a common dermatosis that could be categorized under the big umbrella of hyperkeratosis. It could be simply defined as keratin build-up over the most superficial layer of the skin with no clarified etiology till now but it has been correlated with certain dysfunction in keratinocytes cell cycle that is affected by multiple factors in which we will discuss in

this case report of patient who had developed RHK over surgical scar (1-5). Typically, RHK is a mild, benign skin disorder. Our patient developed RHK because of lack of mechanical friction secondary to his fear of touching his surgical area. This hypothesis is supported by the lack of hyperkeratosis on other parts of his body. Our primary differential diagnosis upon examining the patient included seborrheic keratosis (SK) and viral wart which were ruled

<sup>^</sup> ORCID: 0000-0002-4735-9796.



**Figure 1** Hyperkeratotic plaque covering the midline sternotomy scar.

out after obtaining full medical history from the patient. We present this article in accordance with the CARE reporting checklist (available at <https://acr.amegroups.com/article/view/10.21037/acr-23-28/rc>).

## Case presentation

A 63-year-old man who has been known to have hypertension, dyslipidemia, ischemic heart disease, and a history of coronary artery bypass surgery presented to our

dermatology clinic with an asymptomatic skin lesion over the linear midline sternotomy scar post-coronary artery bypass grafting (post-CABG) that he underwent 8 years ago. A complete skin exam revealed no similar lesions elsewhere. The patient's history was significant of avoiding touching or cleaning the area as he feared disturbing the healing process of his surgical wound. Thus, due to lack of surgical scar care, a thick layer of skin was formed and described as brown hyperkeratotic plaque. Otherwise, his general hygiene was good. Examination revealed yellow/brownish hyperkeratotic papules coalescing into larger, well-demarcated plaques (*Figure 1*).

For further investigation, a 4 mm punch biopsy was taken to confirm diagnosis of RHK and rule out other differential diagnoses. Microscopic examination showed extensive hyperkeratosis along with mild acanthosis and dermal fibrosis/scar. There were no evidence of HPV changes, dysplasia or malignancy (*Figure 2A,2B*).

Based on the clinical picture and supported biopsy findings, the diagnosis of RHK was made.

Treatment and follow-up: the patient chose to have his hyperkeratotic lesion removed manually, which went smoothly as wet gauze with a scalpel blade were used, then it was scrapped with a scraper. The lesion was very soft upon removal and no issues were faced during the process (*Figure 3*).

Patient was educated and reassured throughout the time he was following up in clinic as to prevent recurrence of hyperkeratotic lesion over his surgical scar again.

This study protocol was reviewed and approved by the IRB Committee at the research center of Prince Sultan Military Medical City (No. 112023). All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

## Discussion

Hyperkeratosis could be divided according to its etiology as in hereditary types of hyperkeratosis such as epidermolytic hyperkeratosis or site specific hyperkeratosis like focal acral hyperkeratosis and other non-classified types as well like corn and calluses (1). Hyperkeratosis also can be seen in common dermatosis such as lichen planus and chronic

### Highlight box

#### Key findings

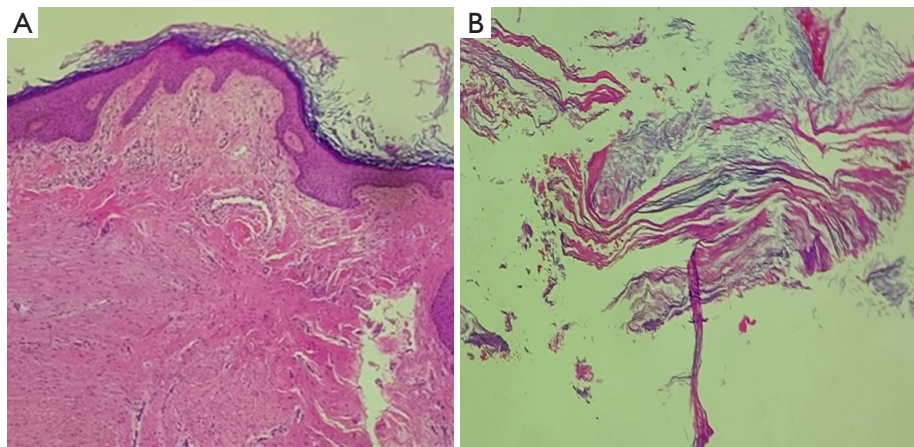
- RHK is associated with poor hygiene as we have seen in our patient's case, it could be prevented by providing

#### What is known and what is new?

- Manual removal of the hyperkeratotic lesion through trimming and clipping the excess layer of skin is effective method used in management of hyperkeratotic report here about what this manuscript adds.

#### What is the implication, and what should change now?

- RHK should be more reported.



**Figure 2** Histological HE pictures of the skin lesion (A); microscopic examination showed extensive hyperkeratosis and dermal fibrosis (hematoxylin and eosin stain,  $\times 5$ ). (B) sloughed keratin layer with extensive hyperkeratosis can be observed. (hematoxylin and eosin stain,  $\times 10$ ).



**Figure 3** Patient's hyperkeratotic lesion removed manually using wet gauze followed by scalpel blade which has been cleared completely.

eczema (1).

Throughout the clinical examination of the patient and based on the observation of the morphology of the hyperkeratotic lesion of the patient, SK and common warts were suggested as differential diagnosis along with RHK. SK is a common noncancerous skin condition in elderly that could present in form of tan or brownish papule or

plaque which is similar to our patient's presentation (2). Common warts or viral warts are described as small verrucous or papillomatous lesions (3), even though it might be less likely in this case due to the size and the shape of the lesion; yet it was not rule out completely at first which were ruled out after taking full history. All previously suggested conditions were considered to be different causes of hyperkeratosis (1).

RHK is a common benign skin condition seen by dermatologists frequently, yet a limited number of cases have been reported up to this day. On cellular level for normal skin growth, keratinocytes differentiate from the deepest layer of epidermis (stratum basale) to the most superficial one (stratum corneum) which considered to be the protective layer of the skin (4). Stratum corneum is mostly composed of terminally differentiated keratinocytes, also known as corneocytes (5). In healthy functional skin, corneocytes are shed in regular matter through biological and mechanical factors as part of skin cell turnover (5). As our patient has not been known to have any previous hyperkeratotic lesion throughout his life nor has the same lesion anywhere else other than over his surgical scar, we thought the development of RHK was caused by dysfunctional skin cell turnover would most likely be due to lack of mechanical friction as he feared touching his surgical scar over the previous eight years. A case reported in 2010 by Harris *et al.* of a patient presenting with RHK over her face to have had similarly developed it due to poor hygiene out of fear of touching her face after being diagnosed with a rare autoimmune endotheliopathy known as Susac

syndrome (6).

Hyperkeratosis management differs depending on type, severity, and chronicity. Topical keratolytics containing urea, tretinoin or other ingredients along with emollients is a gold standard method used in most cases of hyperkeratosis. Topical therapy can be accompanied by lifestyle modifications regarding diet or daily habits. Also, manual removal of the hyperkeratotic lesion through trimming and clipping the excess layer of skin is also a common method used in management of hyperkeratosis as we have done with our patient which have cleared it completely in one session (1).

## Conclusions

As RHK is one of the most benign skin conditions which is easily manageable by dermatologists that can mimic SK and warts, however, since it is significantly associated with poor hygiene as we have seen in our patient's case, it could have been prevented by instructing the patient regarding his wound care post-operatively as to not let his fear impact him on the long-term. Our case represents a rare extreme manifestation related to the fear of our patient to clean surgical wounds.

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## Footnote

*Reporting Checklist:* The authors have completed the CARE reporting checklist. Available at <https://acr.amegroups.com/article/view/10.21037/acr-23-28/rc>

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*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. This study protocol was reviewed and approved by the IRB Committee at research center of Prince Sultan Military Medical City (No. 112023). All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

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