SQUAMOUS CELL CARCINOMA IN A BURN SCAR – A CASE REPORT

Rak płaskonabłonkowy skóry w bliźnie pooparzeniowej – opis przypadku

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Abstract

Squamous cell carcinoma (SCC) arising in a burn scar, known as a Marjolin ulcer, is a rare aggressive skin cancer. We describe a case of a 63-year-old patient with squamous cell carcinoma arising from a 24-year-old thermal burn scar on the dorsal aspect of the left metacarpus. The lesion exhibited gradual ulceration. Local treatment was ineffective. Following histopathological verification and additional diagnostic workup, surgical intervention was undertaken. This consisted of complete resection of the lesion, with simultaneous coverage of the defect using an autologous intermediate-thickness skin graft harvested from the patient's thigh. The described case emphasises the importance of early diagnosis, regular follow-up of burn scars, and prompt intervention, all of which contribute to improving patient prognosis.

Streszczenie

Rak płaskonabłonkowy rozwijający się w bliźnie pooparzeniowej, znany jako owrzodzenie Marjolina, jest rzadkim, ale agresywnym nowotworem skóry. W artykule opisano przypadek 63-letniego pacjenta, u którego rak płaskonabłonkowy rozwinął się na grzbietowej powierzchni śródręcza ręki lewej w miejscu blizny po oparzeniu termicznym sprzed 24 lat. Zmiana stopniowo ulegała owrzodzeniu. Nie poddawała się leczeniu miejscowemu. Po jej histopatologicznej weryfikacji oraz dodatkowych badań diagnostycznych przeprowadzono leczenie chirurgiczne polegające na całkowitej resekcji zmiany z jednoczasowym pokryciem ubytku przeszczepem skóry autologicznej pośredniej grubości pobranej z uda pacjenta. Opis przypadku podkreśla znaczenie wczesnej diagnostyki, regularnej kontroli blizn pooparzeniowych oraz szybkiej reakcji na niepokojące objawy, co przyczynia się do poprawy rokowania pacjentów.

Keywords: surgical treatment; squamous cell cancer; burn scar; oncological diagnosis; Marjolin ulcer

Słowa kluczowe: leczenie chirurgiczne; rak płaskonabłonkowy; blizna pooparzeniowa; diagnostyka onkologiczna; owrzodzenie Marjolina

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Introduction

The skin is the largest organ of the human body, serving as a barrier against external factors and contributing to temperature regulation, water and electrolyte balance, as well as immune responses [1]. It maintains overall homeostasis, protecting the body from harmful external influences [2]. Burned skin loses its integrity and ceases to function as a mechanical and biological barrier against external factors [3].

According to available literature, 1–2% of burn scars can transform into malignancies [4].

The term 'Marjolin ulcer' refers to a malignant tumour arising in areas of chronic inflammation, such as non-healing wounds, burn scars, or other scarred tissues [5]. Patients typically experience tissue damage with scarring or chronic ulceration several decades before diagnosis. Marjolin ulcer is generally considered a highly aggressive tumour with a high mortality rate [6]. A sudden change in the characteristics of a chronic ulcer or a scar should prompt diagnostic testing [7]. Up to 2% of chronic burn scar lesions can transform into malignancies. Most of these are squamous cell carcinomas (SCCs) and, though less frequently, basal cell carcinomas (BCCs) [8]. The incidence of malignant melanoma (MM) arising in such lesions is exceptionally low [9].

Early diagnosis and surgical treatment improve patient prognosis [10].

This paper presents a case of SCC involving the left upper limb following a thermal burn.

Case report

A 63-year-old patient was electively admitted to the Clinical Department of Plastic, Reconstructive, and Burn Surgery at the Military Institute of Medicine in Warsaw for surgical treatment of a skin cancer on the dorsal surface of the left metacarpus.

The patient presented to the Outpatient Clinic of the Military Institute of Medicine in Warsaw in November 2024. He reported a history of a second-degree thermal burn of the left hand and the head sustained from flame contact approximately 24 years earlier. The burn healed, leaving scars. Since then, the patient had experienced periodic skin tears and micro-injuries within the scar. In June 2024, a chronic ulcer developed within the dorsal metacarpal scar of the left hand and gradually enlarged. Local treatment was ineffective. The lesion failed to heal and progressed into a chronic wound. In September 2024, a sample was taken from the dorsal metacarpal surface of the left hand for histopathological examination. SCC was confirmed and the patient was referred for further diagnosis in December 2024. Laboratory workup showed no significant abnormalities. Ultrasound of the peripheral lymph nodes revealed no enlargement in the cervical, supraclavicular, infraclavicular, axillary, or inguinal regions. CT of the chest, abdomen, and pelvis (both with and without contrast) found no neoplastic processes or metastases. Contrast-enhanced magnetic resonance imaging (MRI) of the upper limb was performed to assess disease extent and rule out metastases, and found a heterogeneous lesion on the dorsal skin and subcutaneous tissue of the left hand, measuring 13 mm (AP) × 46 mm (transverse) × 79 mm (craniocaudal), showing irregular contrast enhancement, infiltrating the subcutaneous tissue, and causing oedema of the surrounding soft tissue. At the level of the third metacarpal head, it involved fatty tissue and adhered to vessels without extending to the finger extensor tendons.

The patient was admitted to the Clinical Department of Plastic, Reconstructive, and Burn Surgery at the Military Institute of Medicine in Warsaw in January 2025.

Physical examination revealed an ulcerated tumour measuring approximately 10 × 5 cm and appearing cauliflower-like in the centre, located on the dorsal surface of the left metacarpus (Fig. 1).

The patient had a history of arterial hypertension and classical cholecystectomy. He reported no allergies or drug sensitivities and was regularly taking valsartan with hydrochlorothiazide and amlodipine. He worked as a confectioner. The patient was qualified for surgical treatment. Under general anaesthesia, total resection of the tumour with adequate margins was performed in the operating room (Fig. 2). The specimen was sent for histopathology, with the lesion's poles were carefully marked to assess resectability (Fig. 3).

The tissue defect was immediately covered with a split-thickness skin graft (STSG) harvested from the patient's

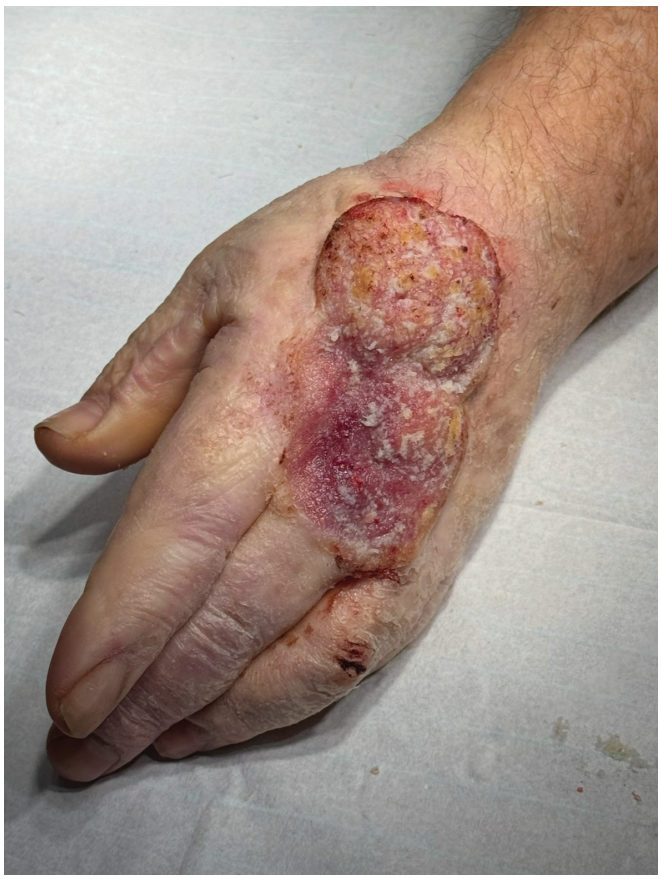

Figure 1. Skin lesion on the patient's left hand

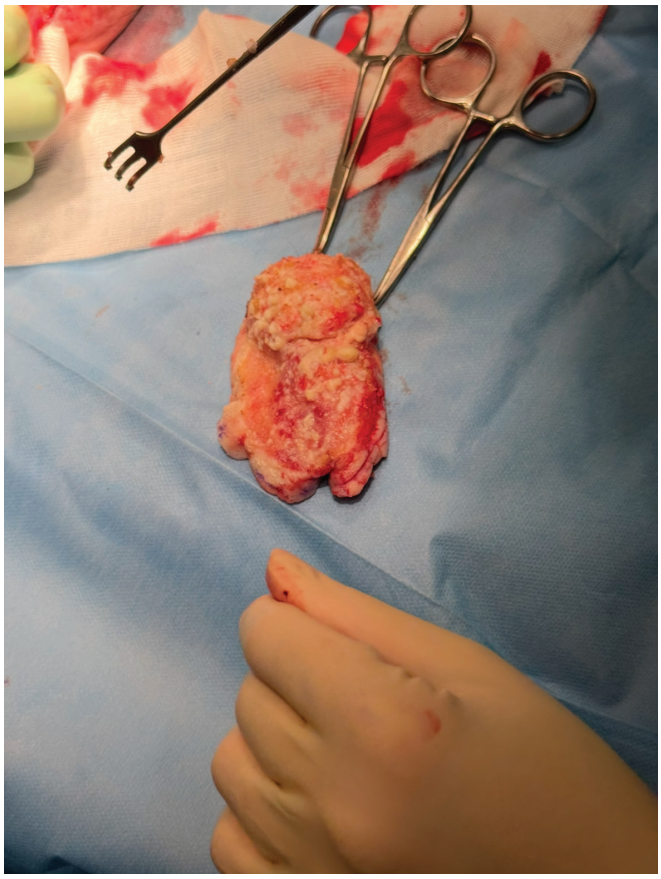

Figure 2. Resected malignancy within the scar on the left hand– intraoperative image

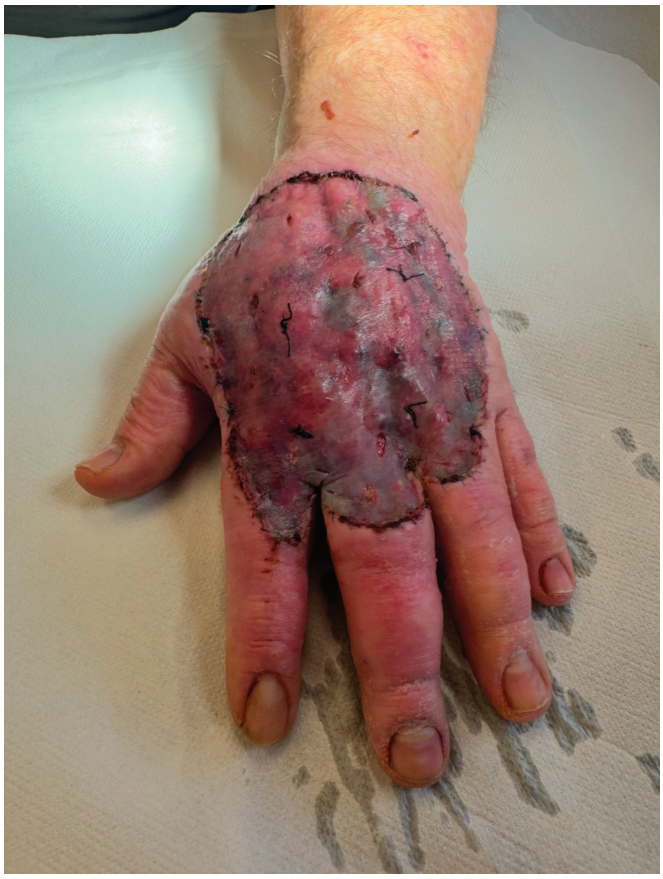

Figure 3. An image taken after resection of the lesion combined with a split-thickness skin graft (STSG) – postoperative outcome

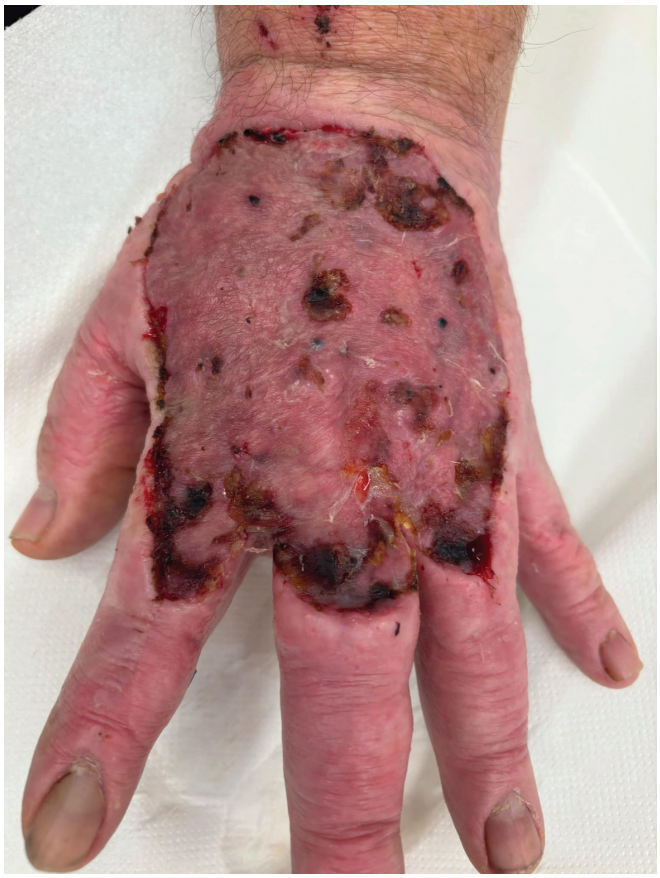

Figure 4. At 1 week postoperatively

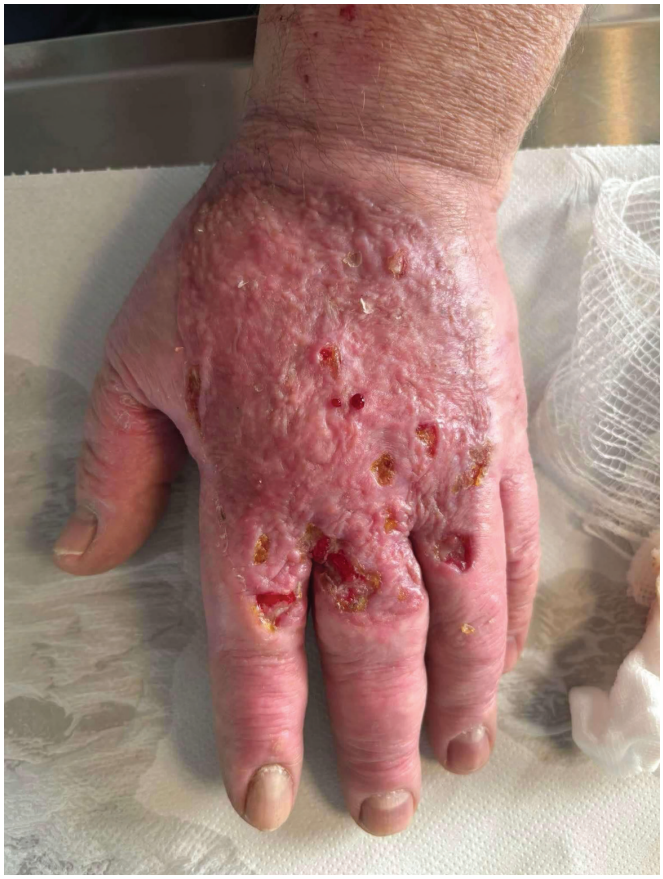

Figure 5. At approximately 3 weeks postoperatively

left thigh. The perioperative and early postoperative periods were uneventful, with regular dressing changes and satisfactory wound healing observed during hospital stay. On the second postoperative day, a wound swab was taken to identify potential microorganisms and guide targeted antibiotic therapy if needed. The patient was discharged home on postoperative day 2 in good general and local condition, with further recommendations.

The first outpatient follow-up, one week after surgical intervention (Fig. 4), showed normal wound healing with no signs of infection or purulent drainage. A subsequent follow-up on February 20, 2025, approximately three weeks postoperatively, showed continued normal healing (Fig. 5). Histopathology, performed about three weeks postoperatively, confirmed invasive, well-differentiated (G1) SCC of the skin, with a maximum diameter of 83 mm and invasion depth of 12 mm. Lymphatic invasion was present, but no neuroinvasion was observed. Surgical margins were free of tumour.

The patient will remain under outpatient oncological follow-up for the next two years.

Discussion

Marjolin ulcer is a malignant tumour arising in previously damaged skin, often in scars or chronic non-healing wounds. Although its pathophysiology has been a subject of debate for many years, it is considered that areas of scar tissue lacking immune cells contribute to its development [11]. These lesions are aggressive, have a poor prognosis, and tend to recur [5]. Squamous cell carcinoma, typically arising in long-standing, chronic scars is the most common histological type [12].

While Marjolin ulcer appears to be more common in some ethnic groups, it is very rare in European populations [13]. It is most often diagnosed in patients in their fifth decade, with men being three times more likely to become affected than women. Lower extremities are most commonly involved (over 50%), followed by the upper limbs, the trunk, and the head [14].

Cancer vigilance is crucial in patients with burn scars, with special attention given to chronic non-healing wounds. Early diagnosis and treatment allow for complete removal of the lesion [13]. Metastases are the most important prognostic factor, with regional and distant metastases observed in 20–66% and 14% of cases, respectively [15].

Radical excision of the lesion and surrounding lymph nodes is the primary treatment. If adequate margins of healthy tissue cannot be achieved, amputation of the affected neurovascular structures is recommended. Neoadjuvant and adjuvant therapies are advised for patients with distant metastases or poor prognostic factors. Local radiation therapy may be considered as an alternative for patients who decline surgery or in cases where tumour location precludes radical excision. However, it should be remembered that radiation may impair wound healing [15].

Particular attention should be paid to the early management of burn patients, and especially interventions to protect the affected area immediately after the burn. Such interventions are crucial for long-term clinical outcomes and may help prevent proliferative changes within the damaged tissues. Although malignant tumours typically develop 25–40 years after a burn, they may occur as early as three months. The risk of recurrence after radical surgery is 14.7% [16]. There is a proven causal link between burns and the subsequent risk of SCC. Given the poor prognosis of advanced scar cancers, early skin grafting is the preferred strategy to prevent recurrent scar ulceration. The incidence of cancer in burn scars has declined in recent years, possibly due to the wider use of this approach [12].

However, the diagnosis of a pathological lesion within a burn scar should not reduce the physician's vigilance. Different types of pathological cells have been found within a single scar in the same patient. There is a known case of a patient in whom SCC in situ, melanoma in situ, and a multinucleated giant cell reaction were identified in an extensive burn scar [12]. Identification of a pathology in one scar area should not lead to underestimating the remaining areas. Cancers arising within different scar regions can occur multifocally; therefore, monitoring and early treatment of the entire burn-healed area are vital.

Also, a case has been reported of a patient with multiple melanomas within a scar on the right side of the body and the upper limb. The tumours were excised, and the resulting defect was covered with STSG. No metastases were detected during diagnostic workup, highlighting the importance of early diagnosis [17].

Marjolin ulcers are also encountered in our population, often developing in burn scars that have healed spontaneously. Vigilant surveillance is essential for managing chronic non-healing ulcers, and all suspicious lesions should be biopsied [18]. Early diagnosis, aggressive treatment, and close follow-up are crucial for patient outcomes [12].

Conclusions

Squamous cell carcinoma arising in burn scars, known as Marjolin ulcer, is a rare yet highly aggressive skin malignancy. The described case of our 63-year-old patient demonstrates that chronic scar tissue can undergo malignant transformation even many years after the injury. Careful monitoring, appropriate scar management, and prompt evaluation of symptoms, such as bleeding, changes in appearance, itching, or increased susceptibility to trauma, are essential for prevention. Early histopathological diagnosis of chronic, non-healing wounds within burn scars is crucial for guiding treatment and improving patient prognosis, highlighting the importance of close patient-physician collaboration to promptly detect any abnormalities. Surgical excision with adequate margins combined with a split-thickness autologous skin graft proves an effective treatment approach. Regular oncological monitoring and close postoperative follow-up are vital for preventing recurrence and improving outcomes. The described case underscores the importance of prompt cancer diagnosis and appropriate management of burn scar lesions.

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