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Malignant degeneration of burn scars: Epidemiological, diagnostic, therapeutic and evolutionary aspects

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Abstract

This retrospective study investigates malignant degeneration of burn scars, specifically Marjolin's ulcers, in 30 patients treated over ten years at the Avicenna Military Hospital. The analysis covers epidemiological data, diagnostic procedures, therapeutic interventions, and outcomes. The findings underline the importance of early detection and management, particularly in socioeconomically disadvantaged populations. Recommendations for prevention and treatment adaptation are proposed.

Keywords: Burn scar; Malignant degeneration; Marjolin ulcer; Prevention

1. Introduction

Malignant transformation in burn scars, first described by Celsius (100 AD) and later detailed by Marjolin (1828), is a severe yet preventable complication. Chronic inflammation, repetitive trauma, and poor initial care contribute to this transformation. This study aims to provide a comprehensive overview of such cases and propose contextualized recommendations.

Chronic ulcers developing into malignancies, specifically squamous cell carcinoma (SCC), represent a significant challenge in clinical management. By examining data from 30 patients, this study sheds light on epidemiological patterns, common diagnostic features, and optimal therapeutic approaches, all within the context of a developing nation.

2. Methodology

2.1. Study Population

The retrospective study was conducted from May 2009 to May 2019, in Avicenna Military Hospital, Marrakech. On Thirty cases confirmed histologically; patients with incomplete records or scars from non-burn causes were excluded.

2.2. Data Collection

Data were extracted from medical records

- Sociodemographic data: age, sex, profession.
- Clinical data: location, size, duration.
- Paraclinical data: imaging, histopathology.
- Treatments: surgery, reconstruction, adjuvants.

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- Postoperative follow-up: complications, recurrence, and patient's satisfaction.

2.3. Therapeutic Approaches

- Surgical excision: done under local or general anesthesia, depending on the size and depth of the lesion.
- Reconstruction: healing by second intention, skin graft, or local flap, according to the size of the defect.
- Adjuvant therapies: radiotherapy and chemotherapy in cases of advanced lesions.

3. Results

3.1. Epidemiology

- Age: Patients ranged from 31 to 75 years, with a mean age of 52.
- Gender: Male predominance (56.7%; 17 males, 13 females).
- Socioeconomic Status: 90% were from low-income backgrounds.
- Geographic Origin: Rural settings accounted for 90% of cases.

3.2. Clinical Characteristics

- Latency Period:The mean time between the initial burn and malignancy was 18 years (range: 2 to 52 years).
- Symptoms: Common complaints included pruritus (83.4%), pain (73.4%), bleeding (60%), and purulent discharge (50%).
- Sites Affected: Lesions were most frequently located on the lower limbs (46.6%), followed by the scalp (26.7%) and upper limbs (26.7%). (Figure 1 and 2)
- Lesion Type: Most presented as ulcero-bourgeonnant masses (80%).

Figure 1 Ulcerative-proliferative tumor on the anterior surface of the upper end of the leg. (Before and after surgery)

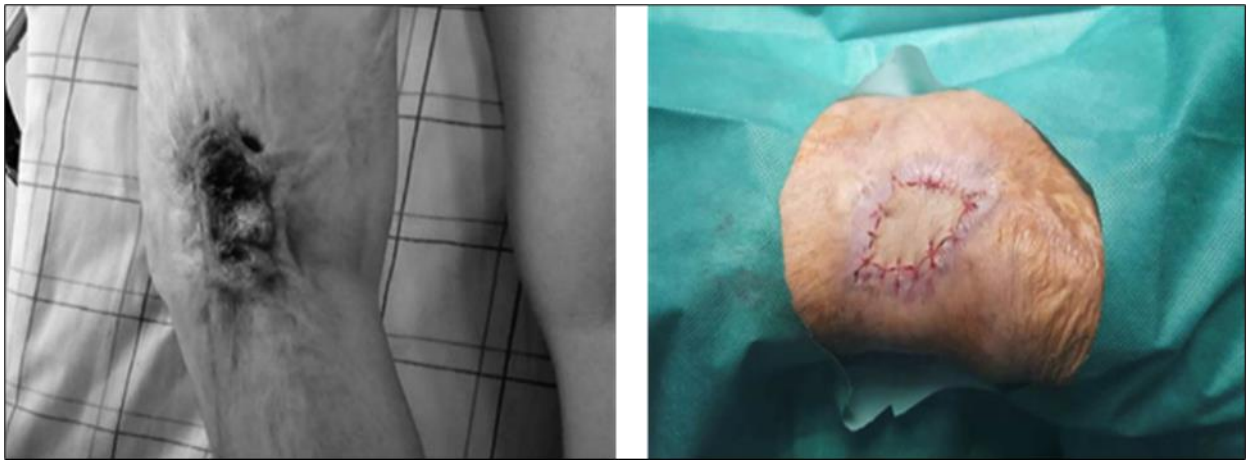

Figure 2 Ulcerative-proliferative tumor on the popliteal fossa. (Before and after surgery)

3.3. Diagnosis

- Histology: All cases were confirmed as squamous cell carcinoma.
- Imaging: Pulmonary metastases were detected in 6.7% of cases via CT scans.

3.4. Treatment

3.4.1. Surgical Intervention

- Complete excision with clear margins was performed in 63.4% of cases.
- Amputation was necessary in 30% of cases, often due to extensive local invasion.
- Radiotherapy: Adjuvant radiotherapy was administered to 16.7% of patients.
- Chemotherapy: Indicated in 6.7% of cases with metastatic spread.

3.5. Outcomes

- Recurrence: 20% experienced local recurrence within a mean period of 11 months.
- Mortality: Two patients (6.7%) succumbed to systemic metastases.

4. Discussion

4.1. Epidemiological Insights

The predominance of cases in rural and low-income populations underscores significant barriers to early detection and treatment. Limited access to healthcare and reliance on traditional remedies delayed appropriate interventions, exacerbating disease progression. [1;2]

4.2. Clinical and Diagnostic Challenges

The long latency period, often spanning decades, complicates early recognition. Chronic inflammation and inadequate initial burn care create a fertile ground for malignancy. The study highlights the importance of regular follow-ups for patients with deep or extensive burns. [3;4]

Histological confirmation remains the gold standard for diagnosis, but integrating advanced imaging techniques such as CT and MRI has improved staging accuracy. Despite this, late-stage presentation remains a challenge, with many patients seeking care only after significant lesion progression. [5;6]

4.3. Therapeutic Approaches

Surgical excision with clear margins is pivotal, but the high rate of amputation highlights the aggressive nature of advanced SCC in burn scars. Adjuvant radiotherapy and chemotherapy, while beneficial in selected cases, have limited impact on long-term survival when metastases are present. [7;8]

4.4. Prognostic and Preventive Measures

The recurrence rate of 20% underscores the need for vigilant follow-up. Public health initiatives should focus on education about burn care and the risks of malignant transformation. Integrating these efforts into primary healthcare can reduce delays in seeking treatment. [9;10]

4.5. Contextual Recommendations

Given the resource constraints in developing nations, adopting a tiered approach to care is crucial. Training local healthcare providers in early burn management and basic oncology can bridge gaps in care. Telemedicine may also facilitate earlier specialist consultations for remote populations. [11;12]

5. Conclusion

Burn scars represent a lifelong risk for malignant transformation, particularly in underserved populations. This study emphasizes the need for preventive strategies, early diagnosis, and multimodal therapy. By addressing systemic barriers, healthcare systems can improve outcomes for patients with burn-induced malignancies.

Compliance with ethical standards

Disclosure of conflict of interest

All the authors declare that they have no conflict of interest.

Statement of informed consent

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

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