Histopathological Analysis and Management Considerations of Post-Burn Pyogenic Granuloma

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ABSTRACT

Post-burn pyogenic granuloma is a rare entity. It is a variant of haemangioma that manifests after two to four weeks in burn wounds. The burn causes the skin and mucosa to vascularise intensely and rapidly, developing tissue that resembles haemangioma. We present a case of a young male with multiple painless swellings over the burn scar. Histopathological examination revealed the exact nature of pathology, evidenced by hyperplastic epithelium and granulation tissue with chronic inflammatory cells. This case emphasises the rarity of pyogenic granuloma after burn and the significance of histopathology in diagnosis and its management.

Key Words: *Curettage, Histopathology, Post-burn pyogenic granuloma.*

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INTRODUCTION

A non-cancerous vascular growth that develops from the mucosa and skin, and rarely subcutaneously or intravascularly, is known as a pyogenic granuloma (PG). It manifests as a painless or sometimes painful papule that may bleed in the presence or absence of minor trauma.[1] The PG after burns are extremely uncommon; they typically develop following a second-degree burn.[2] While the exact cause of PG is unknown, conditions such as trauma, infections, and hormonal changes may contribute to the disease's development. Although numerous dispersed PGs are uncommon, they have been observed after burns and have been specifically linked to burns from boiling milk.[2] The classic condition is most common in young adults and children, with a female-to-male ratio of 2:1, presumably due to the vascular effects of female hormones.[3] But, in the present case, the patient was a male.

CASE REPORT

A 21-year male, a non-smoker, had suffered superficial to deep burns on his right upper arm and chest from car radiator water, affecting about 2% of his total body surface area two months back. He reported to the local clinic, where he was managed conservatively.

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Daily dressing with silver sulfadiazine was advised. His wound initially got better after two weeks of treatment. Later, he noticed a small, painless lump on the burn wound that grew larger and eventually covered the entire area. Then, he presented to our outpatient department.

On arrival, physical examination showed multiple non-tender angiomatous papulonodular ulcerated lesions with crusted surfaces on the burn scar. The largest lesion measured approximately 4 × 5 cm in size and readily bled when touched. Skin beyond the burn wound was normal. No signs of local or systemic infection were found. His bilateral axillary lymph nodes were normal.

The laboratory investigations, including haematological and biochemical profiles, were normal. A sample for culture was not taken from the lesion. Based on history and examination findings, a diagnosis of granuloma or fibroma was made.

He underwent an excision biopsy of a lesion over the chest with primary closure. Curettage was done for the lesion over the arm. Bleeding was controlled with adrenaline-soaked gauze. The sample was sent for histopathology. The patient followed up regularly to monitor for recurrence. After four weeks, his wound completely healed leaving an atrophic scar (Figure 1).

Afterwards, histological analysis confirmed the diagnosis. Microscopic examination revealed soft tissue lined by skin consisting of hyperplastic, hyperkeratotic, and acanthotic epithelium. Underlying tissue shows granulation tissue consisting of multiple vascular channels along with marked infiltration by chronic inflammatory cells. Foci of necrosis were seen, but no atypia was noted (Figure 2 A,B).

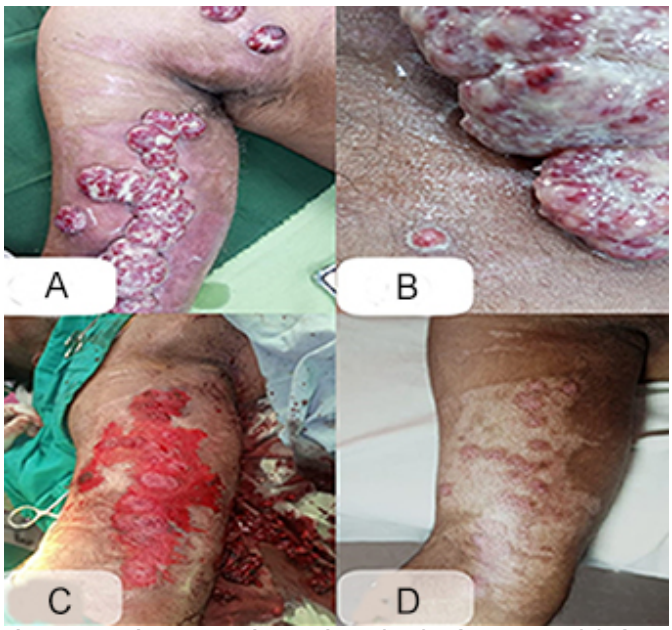

Figure 1: Post-burn pyogenic granuloma. (A, B) Before surgery, (C) After surgery, (D) complete healing at four weeks.

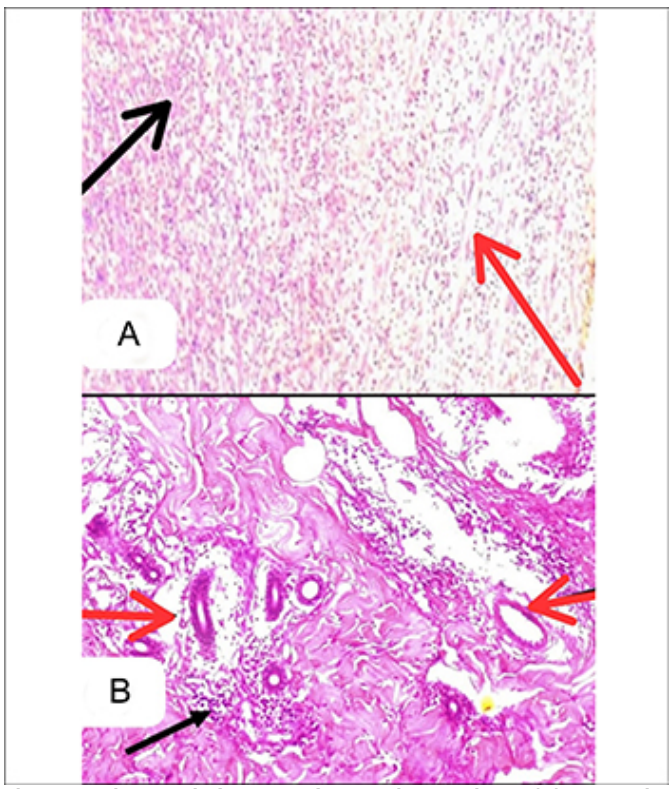

Figure 2: Microscopic features of pyogenic granuloma. (A) H&E stain, ×400. (B) H&E stain, ×100. The black arrow shows chronic inflammatory cells, while the red arrow shows vascular channels.

DISCUSSION

Many risk factors have been reported, but the specific aetiology and pathophysiology of post-burn PGs are still unknown. Among all risk factors, trauma is the most common.[4] Additional risk factors include hormones, microscopic vascular abnormalities, viral oncogenes, and fibroblast gene depression.[5] Lesions, particularly those on the face, can bleed and create psychological discomfort. Thus, correct diagnosis and treatment of these benign lesions are very important.

This patient's PGs developed on the skin of the arm and chest following exposure to hot distilled / coolant water from the car radiator. However, burn trauma was not the sole cause of post-burn PG formation, but rather due to a combination of other factors. PG following burns differs from traditional PGs.[4,6] On a macroscopic level, it is a protruded mass with surface ulceration or a white surface that bleeds readily upon contact. This feature is commonly used to characterise post-burn PGs.[7] Because of this, post-burn PGs may be mistakenly diagnosed as malignancy, underscoring the significance of histology in establishing a conclusive diagnosis. The best way to characterise post-burn PGs under the microscope is as a capillary haemangioma encircled by inflammatory cells in a loose connective tissue stroma. PG is made up of a large number of capillaries with plump endothelial cells lining them, as well as an edematous stroma with infiltrates of both acute and chronic inflammatory cells.[7-9] Despite being a benign lesion, malignant tumours such as amelanotic melanoma, basal cell carcinoma, and spindle cell tumour may be included in the differential diagnosis of PG.[9] The histopathologic evaluation served as the basis for the differential diagnosis.

For PGs, a number of treatment options are available, such as topical imiquimod, curettage and cauterisation, laser, and surgical removal. However, these are invasive procedures that may cause discomfort, scarring, and other local adverse effects.[4,7] Furthermore, studies have demonstrated that beta-blockers are a successful treatment for small PGs, particularly in younger patients but recurrence rates are high.[8] We found only surgical treatment of these lesions to be successful. Similarly, Keshavarzi *et al*. also recommended surgical management with no recurrence reported after a year.[4] To date, we have also not observed any recurrence in this case.

It is concluded that post-burn PG is a diagnostic dilemma. Histopathological analysis is essential to make the confirmatory diagnosis. Surgical treatment is effective in post-burn PGs and should be offered to patients.

PATIENT'S CONSENT:

Patient's explicit consent was obtained to publish this case report.

COMPETING INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

NQ: Conception, design, drafting, and critical revision of the manuscript.
ZS: Contribution of the analysis and interpretation of data for the work.
MS, MSZ: Drafting of the work and critical revision of the manuscript for important intellectual content.
ST: Final approval of the version to be published.
All authors approved the final version of the manuscript to be published.

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