Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Surgery

Infections in Burn Patients: Microbiological Profile, Complications, and Management

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DOI: https://doi.org/10.36347/sjmcr.2026.v14i11.065 | **Received:** 29.09.2026 | **Accepted:** 12.11.2026 | **Published:** 17.11.2026

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Abstract | **Original Research Article**

Background: Burns disrupt the skin barrier and increase susceptibility to infection. Diagnosis is challenging because of the systemic inflammatory response following burn injury. ***Methods:*** This retrospective study included 80 hospitalized burn patients who required surgical management between June 2025 and June 2026 at Mohammed VI University Hospital in Marrakech. The reported variables included C-reactive protein (CRP), white blood cell counts, culture results, nosocomial infections, repeat skin grafting, multiorgan failure, and deaths. ***Results:*** The presentation reported 60 infections among 80 patients (75%), a mean CRP level of approximately 150 mg/L, 48 cases of delayed wound healing or repeat grafting, 12 episodes of sepsis or multiorgan failure, and eight deaths attributed to septic shock. The organisms reported included Pseudomonas aeruginosa, Klebsiella pneumoniae, Escherichia coli, Acinetobacter baumannii, and Staphylococcus aureus; organism-specific counts were unavailable. ***Conclusion:*** This series highlights the burden of infectious complications among burn patients requiring surgery. Interpretation requires verification of diagnostic criteria and individual patient data.

Keywords: Burns; nosocomial infection; microbiology; sepsis; plastic surgery.

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INTRODUCTION

Burn injuries disrupt the skin barrier, promoting wound colonization and, in some patients, wound infection. Repeated wound care, invasive devices, surgical procedures, and prolonged hospitalization may increase the risk of healthcare-associated infections. However, fever, tachycardia, leukocytosis, and hyperglycemia may also reflect the post-burn inflammatory response and do not, on their own, establish infection.

The aim of this study was to describe the frequency of reported infections, the microorganisms identified, and the complications observed among burn patients who underwent surgery in our department, and to discuss diagnostic, therapeutic, and preventive principles.

MATERIALS AND METHODS

This was a single-center retrospective study based on the medical records of burn patients hospitalized between June 2025 and June 2026 in the Department of Plastic, Reconstructive and Aesthetic Surgery at Mohammed VI University Hospital in Marrakech. The source presentation reported a total of 80 patients.

The stated inclusion criteria were hospitalization for a burn injury, the need for surgical management, performance of at least one surgical procedure, and clinical and laboratory monitoring during hospitalization. The stated exclusion criteria were exclusively outpatient management, no surgical procedure, incomplete records or insufficient microbiological information, and transfer or loss to follow-up before infectious assessment.

The parameters studied included CRP, white blood cell counts, culture results, occurrence of nosocomial infection, delayed graft healing or repeat grafting, multiorgan failure, and mortality. Operational definitions of infection, sepsis, and delayed wound healing, as well as the method used to calculate mean CRP, were not specified in the presentation and should be added after verification of the medical records.

The analysis presented here is descriptive. Statistical tests and independent risk factors cannot be calculated from the available aggregate data alone.

RESULTS

Of the 80 patients included, 60 were classified as having a documented or clinically diagnosed nosocomial infection (75%). No infection was reported in the remaining 20 patients. Mean CRP was reported as approximately 150 mg/L, without specifying the sampling time or the subgroup to which this value referred.

Indicator	Reported number	Proportion of cohort
Patients included	80	100%
Reported infection	60	75%
No reported infection	20	25%
Delayed wound healing / repeat grafting	48	60%
Sepsis / multiorgan failure	12	15%
Deaths attributed to septic shock	8	10%

Complication categories may overlap and should not be summed. Denominators for subgroup analyses restricted to infected patients remain to be specified.

The microbiological profile described in the presentation was polymicrobial. The Gram-negative bacteria mentioned were Pseudomonas aeruginosa, Klebsiella pneumoniae, Escherichia coli, and Acinetobacter baumannii. The Gram-positive organisms included Staphylococcus aureus, including methicillin-resistant strains, Streptococcus pyogenes, and Enterococcus faecalis. Candida albicans and Candida tropicalis were also mentioned. In the absence of species-specific counts, their frequencies cannot be quantified and microbiological predominance within this cohort cannot be confirmed.

DISCUSSION

The reported infection rate (75%) should be interpreted in the context of a selected population of hospitalized burn patients who required at least one surgical procedure. Because initial burn severity, burn extent, length of hospital stay, and exposure to invasive devices were not quantified in the source material, this rate cannot be directly compared with rates in unselected burn populations.

Distinguishing colonization from infection is essential. A positive wound culture alone is insufficient to establish a diagnosis of invasive infection. Monitoring should account for local wound changes, hemodynamic alterations, urine output, neurological status, and laboratory findings. Clinical deterioration should prompt an investigation of possible sources, including wounds, catheters, lungs, the urinary tract, or medical devices.

The source material emphasizes the need for early infectious source control, including debridement, drainage, or removal of a suspected device when indicated. In cases of sepsis or septic shock, appropriate specimens should be obtained without delaying urgent antibiotic therapy. Empirical treatment should consider disease severity, previous cultures, prior antibiotic exposure, and local microbiological epidemiology; subsequent reassessment and treatment adjustment or de-escalation are required according to microbiological findings and clinical progress.

Prevention includes hand hygiene, minimizing exposure to invasive devices, judicious microbiological surveillance, and early wound closure whenever possible. Operating-room pathways and isolation measures should follow local infection prevention protocols.

The timeline illustrating changes in microbial flora in the presentation was explicitly adapted from the literature. It does not represent a longitudinal analysis of specimens collected from these 80 patients and is therefore not presented as an original finding.

CONCLUSION

In this retrospective series of 80 burn patients requiring surgical management, the presentation reported 60 infections and several severe complications, including repeat grafting, multiorgan failure, and deaths attributed to septic shock. A strategy based on ongoing clinical monitoring, targeted microbiological testing, source control, and appropriate antibiotic therapy appears central to management. Validation of individual patient data and diagnostic definitions is essential before scientific submission.

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