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## Opinion Article

## Second-degree Burns: Contemporary Management, Evidence Gaps, and Practical Proposals

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## Introduction

Q2 The prevalence of burns requiring medical attention in Spain is approximately 300 per 100,000 inhabitants. Each year, more than 6500 emergency visits are due to burns, with second-degree burns being the most frequent type.<sup>1</sup> In this context, we aim to present several reflections following a literature review on the management of superficial second-degree burns, a topic of great relevance in clinical practice.

Burns have unique characteristics that distinguish them from other types of wounds. In particular, they induce a more intense and prolonged inflammatory response than traumatic wounds,<sup>2</sup> which is reflected in higher levels of proinflammatory cytokines and increased infiltration of neutrophils, macrophages, and lymphocytes in the lesion. Furthermore, burns exhibit slower reepithelialization compared with traumatic wounds due to the absence of dermal structures such as hair follicles and sebaceous glands, which facilitate regeneration in superficial traumatic wounds.<sup>2</sup>

One of the main controversies is the management of blisters. Clinical practice guidelines on burn care advocate for debridement, but literature supports leaving blisters intact in most cases, as they provide a natural biological barrier against infection and dehydration.<sup>3</sup> However, when blisters are large, tense, or painful, sterile drainage is recommended without removing the blister roof. This approach relieves pain while maintaining the biological protection offered by the blister roof.<sup>3</sup>

Ro et al. reported that blister aspiration, compared with deroofing, is more effective for pain relief and wound healing without increasing infection risk. They found no significant differences in healing time, with complete reepithelialization averaging about 12 days.<sup>3</sup>

Another area of controversy concerns the products used in burn management. Ji et al. recommend, in the initial stage, cleansing the wound surface with mild soapy water or tap water and using transparent, low-toxicity, minimally irritating disinfectants such as chlorhexidine acetate or hypochlorous acid solution for subsequent dressings, while avoiding agents such as povidone-iodine or silver-based products.<sup>4</sup> This recommendation is noteworthy given that there is broad consensus against using antiseptics in the treatment of uncomplicated acute superficial wounds.<sup>5</sup> Moreover, a Cochrane review concluded that the evidence is

very limited and that there are no comparative studies on infection rates between antiseptics, antimicrobials, and other products such as honey.<sup>5</sup> Among the most widely used options are:

1. Silver sulfadiazine (SSD): This topical agent remains widely used to prevent infection in second- and third-degree burns. However, its potential cytotoxicity to skin cells may delay wound healing.<sup>4</sup>
2. Biodegradable synthetic membranes: These have proven effective for pain management and healing in burns, allowing dressing changes to be spaced out and reducing the psychological and physical impact of treatment.<sup>4</sup>
3. Bacterial cellulose (BC) dressings: These promote a moist environment and protect against bacterial invasion. They reduce healing time vs petrolatum gauze.<sup>6</sup>
4. Silver-containing hydrofiber dressings: Effective for exudate control and reduction of local inflammation, but, like SSD, may be cytotoxic.<sup>4</sup>
5. Alginate dressings: Ideal for burns with moderate to high exudate, they absorb excess fluid and maintain a moist environment conducive to healing. They can remain intact for several weeks, reducing dressing frequency and associated pain.<sup>7</sup>
6. Zinc oxide (ZnO): Has antimicrobial, anti-inflammatory, and epithelialization-promoting effects. Aarsal et al. compared the use of SSD with ZnO and found that in the ZnO group, the time to reach 50% and 80% reepithelialization was 4 and 5 days shorter, respectively. Topical zinc application reduces necrotic tissue and promotes epithelialization.<sup>8</sup>

Regarding topical corticosteroids, although limited published studies suggest no clear benefit,<sup>9</sup> since burns are highly inflammatory lesions, they could potentially accelerate healing and reduce the risk of pathological scarring.<sup>10</sup>

In conclusion despite being a very common type of wound, evidence regarding the treatment of second-degree burns and comparisons among different therapies and protocols remains weak.

Our proposal is to preserve the blister roof as a natural dressing and use products such as ZnO and alginate, which are equally or more effective than silver sulfadiazine, allow for less frequent dressing changes, reduce associated pain, and avoid the use of SSD, which is cytotoxic and delays healing.

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