



## Research Article

# Healing Second-Degree Burned Skin through Telemedicine during Covid-19 Pandemia Using Topical Heparin

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### Abstract

The utilization of telemedicine has gained prominence, especially in times of restricted physical interaction due to the COVID-19 pandemic. We present a successful healing for domestic second-degree burn injuries solely through telemedicine-guided treatment, employing topical heparin as a pivotal therapeutic agent. This work examines the efficacy and challenges of this remote healing approach, shedding light on the potential of simple treatment with topical heparin in optimizing wound management in superficial burn patients, even from a distance.

**Keywords:** Second Degree Burn; Topical Heparin; Telemedicine; Skin Burn; Heparin; Wound Healing

### Introduction

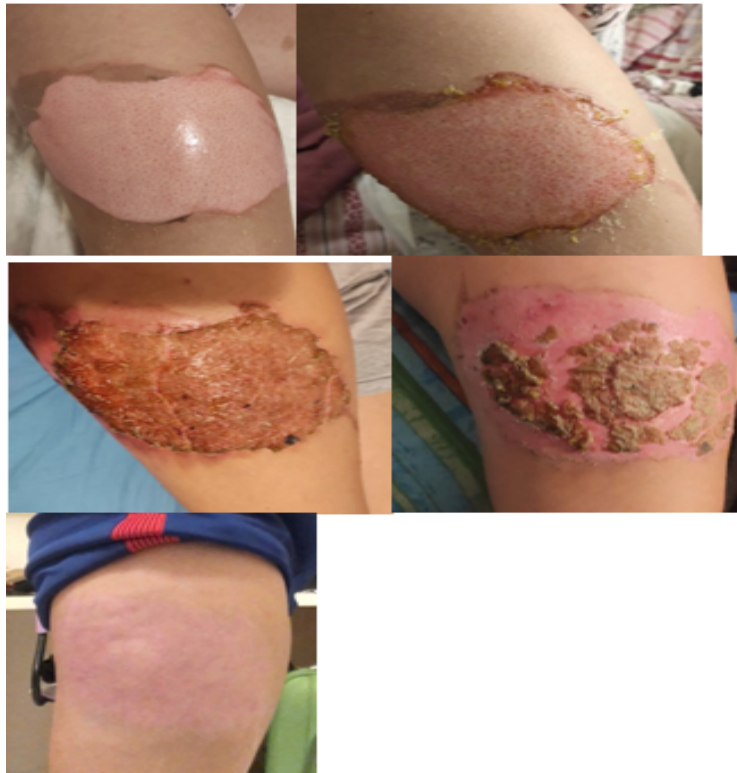
The start of the pandemic in early 2020 changed our way of working in the health sector, as we know it. We were forced into lockdown and this resulted in a detrimental effect on providing basic medical healthcare. Italy was especially hard hit in Europe and our Castel San Giovanni Hospital was transformed into the first Covid Specialty hospital in Europe. The Plastic Surgery department had their normal activity halted and we were re-trained to care for Covid patients [1]. Access to standard resources for safe care was reduced worldwide [2].

Telemedicine has emerged as a vital tool to bridge the gap between patients and healthcare providers during periods of social distancing and restricted mobility. The COVID-19 pandemic has accelerated the adoption of telehealth solutions, presenting opportunities for innovative treatment strategies [3]. This work

demonstrates the potential of telemedicine-assisted wound care using topical heparin in healing second-degree burn injuries, circumventing the need for in-person medical visits.

### Materials and Methods

Six burn patients contacted us and were initially evaluated through photographic presentation and the patient's anamnesis. After our evaluation we asked them to begin treatment by disinfecting the affected area with chlorhexidine only the first day. The treatment plan involved the application of topical heparin (LMW, Clexane 4000 I.U.) dripped three times a day to the affected areas, guided by virtual assessments and follow-up. No dressing was applied and the wound was open to air-dry. No antibiotics or creams were used. The patient's progress was monitored remotely day by day with self-photo. (Figure 1,2,3,4,5,6). No adverse effects were observed. The treatment was continued daily until the burned skin was completely healed. Pain assessment was performed using a VAS scale.



**Figure 1:** Girl 23 Y/O Burn of the Thigh by Hot Water and the Evaluation of Healing Progression.



**Figure 2:** Female 63 Y/O, Gluteus Areas Burns by Hot Water and the Evaluation of Healing Progression.



**Figure 3:** Boy 7 Y/O, Face And Left Hand Burns by Flame (Alcohol Bottle Explosion) And the Evaluation of Healing progression.



**Figure 4:** Female 35 Y/O, Thigh Burn by Hot Water and the Evaluation of Healing Progression.



**Figure 5:** Female 50 Y/O, Hand Burn by Hot Water and the Evaluation of Healing Progression.



**Figure 6:** Boy 5 Y/O Thigh Burn by Hot Water and the Evaluation of Healing Progression.

## Results

The pain was decreased in few minutes after application of topical heparin in all patients.

The healing progress were observed day by day and was under the direct vision of the pictures by a plastic surgeon of our team: the burned area becomes more and more crusty day after day, until the crusts break and fall off, leaving space for the new underneath healed skin. No complications were observed.

Patient's compliance was easy to perform the topic procedure on burned areas. All the patients were satisfied to apply an easy, effective and painless solution in this difficult period of lockdown at home.

## Discussion

In the case of non-extensive and second degree skin burns, they are usually evaluated by the specialist and subsequently must be medicated several times with creams and fatty gauzes to promote healing.

The use of low molecular weight heparin alone, applied topically over the burn area, without any overlay dressing is effective in pain reduction [4]. This benefit is very important considering the cases of children because we know well what it means to treat a burnt child with gauze and disinfectants [5]. In adjunct the pain reduction allow an early mobilization of the area burned. The versatility of this technique is easy to perform when you are alone confined at home such as in these cases during the pandemic. The open dressing allows direct visualization of the burn area and the vision of healing progression [6] and allow to touch the burned area as little as possible while the re-epithelialization process takes place. The simple topic application in the open air avoid to purchase gauze and reduces costs.

Heparin, known for its multifaceted properties, was selected for its potential to accelerate wound healing without dressing on the burned skin [7]. The anti-inflammatory effects of heparin were expected [8,9]. Pain was decrease in few minutes, while its ability to modulate angiogenesis and tissue regeneration could expedite recovery [10].

While remote domestic burn wound management shows promise, challenges arise concerning accurate assessment, patient compliance, and the potential need for immediate intervention in critical situations. The lack of direct physical examination poses limitations, emphasizing the importance of clear communication between the healthcare provider and the patient. This evaluation

underscores the potential of telemedicine and the simple method open air with dripped topical heparin in revolutionizing wound care, avoiding the transfer to the doctor for the medications. The successful outcome in this instance warrants further exploration of telemedicine-guided treatments for domestic injuries, especially in scenarios where access to specialized healthcare is restricted.

## Conclusion

The remarkable healing of domestic second-degree burned skin using telemedicine-guided topical heparin treatment signifies an advancement tool in wound management strategies. This case highlights the collaborative efforts of medical professionals and patients and therapeutic agents to achieve successful outcomes, emphasizing the importance of adaptability and innovation in modern healthcare.

**Declaration of interest:** No potential conflict of interest was reported by the authors.

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