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## Case Report

# The danger of DIY Do-It-Yourself related full thickness burn injury: Case report during COVID-19 lockdown in Ireland

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## ABSTRACT

DIY injuries are a common cause of presentation to hospital around the world. During the COVID19 Pandemic there was a significant increase in the number of household injuries. Many of these injuries occur commonly in the home and they presented in increased proportions due to lockdown measures. However during lockdowns people also undertook activities they would normally outsource to skilled professionals which resulted in unique mechanisms of injury. We present the case of a young woman with a delayed presentation of a full thickness burn following the use of an at home laser hair removal device. We will discuss the recent literature on the effects of the pandemic on presentations to emergency services, the surgical management of this injury and its' reconstruction with biodegradable temporising matrix.

## 1. Introduction

The risk of injury during Do-It-Yourself (DIY) activities is not new. It is a major cause of presentations to emergency departments as well as Plastic Surgery trauma clinics. During the COVID19 pandemic people were unable to access many services such as beauticians, gardeners, and hairdressers, due to prolonged lockdowns. The Republic of Ireland has had some of the most prolonged and stringent lockdown policies in Europe as noted in the Government Response Tracker developed by Oxford University [1]. This resulted in many people performing DIY activities within their homes and gardens that they would normally outsource to skilled professionals. As a result there has been an increase in the number of presentations with DIY injuries to health services across the world from minor injury units to major trauma centres. There have been no studies yet determining the impact of this on Plastic Surgery departments in Ireland but several have been performed globally. One centre in Australia saw a 327% increase in DIY injuries during a 2 month lockdown in Sydney than compared to the same period in 2019 [2]. These DIY injuries affected Orthopedic services similarly with one study by Hampton et al identified a large increase in DIY/gardening relating injuries with 26% during lockdown compared to 5% in the same period in 2019 [3]. Another centre in the UK compared the aetiology of presentations to their major trauma centre, which saw only 24% of injuries seen in 2019 occurring in the home compared to 67% of injuries seen during lockdown [4]. There was a significant increase in injuries in the

home during country-wide lockdowns despite public health safety campaigns published by BAPRAS in the UK (Appendix 1) [5]. Unfortunately there were no similar social media campaigns implemented in Ireland. We will now discuss the case of a full thickness burn injury seen in our unit during the COVID 19 Lockdowns in Ireland and the reconstruction using a dermal matrix substitute.

## 2. Case

We present the case of a 34 year old woman with no significant comorbidities who was seen in our trauma clinic 5 days after sustaining a full thickness burn above her right lateral malleolus after using a home laser device for hair removal.

Our patient had purchased the device online (Fig. 1), there were no settings on the machine and it did not include instructions or safety advice, however it did include a sachet of “numbing cream” which unfortunately she had discarded and she could not recall any medication name listed. Given the lack of available instruction, she arbitrarily decided to begin using the device on her right ankle, pressed it to the skin and started it by pressing the button on the handle. She had been using the device for no more than two minutes before she noticed local skin changes which caused her to stop using the device. She had no pain while using the device likely as a result of the local anaesthetic provided. The extent of the injury was therefore underestimated by the patient which resulted in her delayed presentation to our unit. On examination

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Fig. 1. Device used.

in our trauma clinic she had a full thickness burn involving skin and subcutaneous tissue with an overlying eschar above her right lateral malleolus. The patient's total body surface area burned was <1% (Fig. 2).

Less than 24 h after initial presentation (Day 6 post injury) the necrotic skin was debrided in theatre (Fig. 3). The fascia was largely intact and there was no injury to underlying muscles or tendons however the sural nerve was partially exposed. The area was washed out and samples were sent for microbiological analysis. A negative pressure wound therapy (NPWT) dressing was used to cover the defect (continuous; 125 mmHg). This was changed twice weekly and used for 17 days prior to BTM application.

When the wound bed was clean and granulating (Fig. 4) reconstruction options were discussed with the patient. As there were still partially exposed structures and a significant contour defect present, the options available to our patient included: sacrificing the nerve followed



Fig. 3. Wound post initial debridement.

by split thickness skin graft reconstruction, local flap reconstruction, or synthetic dermal matrix reconstruction. It was decided to proceed with biodegradable temporising matrix (BTM) application to cover the partially exposed sural nerve (Fig. 5). A NPWT dressing was then reapplied over the synthetic dermal substitute (continuous; 125 mmHg) and left in place for a further 14 days. At this stage the patient was brought back to theatre and the BTM superficial polyurethane layer was removed. The BTM was mature and vascularised. A split-thickness skin graft was applied over the granulating bed (Fig. 6) and a negative pressure dressing was placed over it (continuous; 125 mmHg). This dressing was left for 5 days and then discontinued. At her most recent review, over 8 months after the initial injury, her skin graft was stable and soft, and she was very happy with the final outcome (Fig. 7).

### 3. Discussion

In our case of a full thickness burn from a handheld laser hair removal device, this mechanism of injury was unique in our unit and likely came about as a direct result of pandemic related lockdowns and closure of non-essential services such as beauticians. A simple google search performed by the authors for “at home laser hair removal” returns 119 million results. Unfortunately, one must trawl through pages of ads and beauty blogger articles lauding this treatment before the first



Fig. 2. Wound on day of presentation.



Fig. 4. Wound post VAC negative pressure therapy with healthy granulating base.



Fig. 5. Wound post BTM application.

headline mentioning the safety risks of this procedure appears. This may explain why in many cases of injuries such as this our patients undertake these procedures with no knowledge of the risks and recommended safety precautions. The increase in DIY related injuries was anticipated by many centres with the British Association of Plastic Reconstructive and Aesthetic Surgeons (BAPRAS) and the British Burns Association even creating advertisements to warn the public regarding safety precautions within the home (Appendix 1). These focussed on requests that people be cognisant of the burden of COVID19 pandemic on services and to reduce household injuries to the best of their abilities. They included some of the most common injuries seen in Plastic Surgery units across the world, such as kettle scalds, cooking injuries, circular saw injuries and hair straightener burns. It was noted in a study published in 2021 by Welman et al [4] that this is likely to have been quite impactful as they found that, although the proportion of household injuries increased, the overall frequency of these presentations reduced during the pandemic.

Dermal substitutes are an extremely versatile option for burns reconstruction. NovoSorb is the device used in this case and is an entirely synthetic polymer [6]. It does not contain any biological components which allows it to maintain its robust structure even in the presence of bacteria. The BTM layer temporarily closes the wound

limiting moisture loss [6]. Cellular migration into the matrix results in neovascularisation and collagen production creating a new dermal layer over 2–3 weeks. Once the polyurethane sealing membrane is removed the newly vascularised layer can be left open to allow epithelialisation with simple dressings or can be covered with a split thickness skin graft. The synthetic matrix is fully absorbed at approximately 18 months. In a 2018 case series performed by Greenwood et al. [7], NovoSorb BTM was studied in the reconstruction of wounds post burn eschar excision. It was found that BTM provided an excellent seal with minimal failure of the matrix to integrate (<7%). Additionally skin graft failure and need for re-grafting was very uncommon. Given its malleable properties it easily conforms to areas that would otherwise be difficult to contour with classical skin grafting techniques. It also provides a surface that is suitable for application of a skin graft over an otherwise ‘ungraftable’ surface. In our case it was applied over a partially exposed sural nerve in a highly mobile area of the lateral ankle with excellent functional and cosmetic outcomes for our patient.

#### 4. Conclusion

DIY injuries are a common and often avoidable cause of presentation





**Fig. 6.** Wound post removal of BTM silicone and split thickness skin graft application.



**Fig. 7.** Wound 8 months post split thickness skin graft application.

to Plastic surgery trauma clinics. Patient education regarding safety in the home is an important public health measure that should be more widely implemented. It is very important that the public are advised against use of devices without instructions or safety recommendations to avoid inadvertent injury.

Innovation in reconstructive surgery has given us new and adaptable methods of treating a multitude of injuries. Devices such as dermal matrices are a useful way of managing difficult wounds. In our case, BTM was used to great effect in the management of a full thickness burn in a mobile area with a significant contour defect.

##### 5. Patient consent

Consent was obtained from the patient who's case is discussed in the

above case report.

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Appendix 1

Manchester University  
NHS Foundation Trust

**NHS**

# AVOID INJURY

## WHILST IN SELF ISOLATION

Burning Rubbish

Chip-pan Fires

Kettle Scalds

Iron Burns

Hob / oven

Cooking injuries

Hot food + drinks

DIY injuries

Steam inhalation

Electrical injuries

Circular Saws

Drink Responsibly

Hair Straighteners

Hot water bottles

**YOUR NHS NEEDS YOU!**

**ALLOW YOUR HOSPITAL TO BEAT COVID-19**

**BE SAFE AT HOME**

**STAY SAFE AT HOME**

**BAPRAS**  
British Association of Plastic  
Reconstructive and Aesthetic Surgeons

**Burns & Plastic Surgery Unit Wythenshawe Hospital**

BRITISH BURN ASSOCIATION

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