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Case report

Burns following attempted electrosurgical tattoo removal

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1. Introduction

Tattooing has been a popular method of body adornment since the beginning of recorded history, and possibly before this. The earliest evidence goes back to an ice age man named Otzi who lived some 5300 years ago [1]. These tattoos, by their very nature, are designed to be permanent and were initially used to identify important passages in life or have medicinal benefits [1]. It seems, however, that as long as tattoos have existed, we have been looking for ways to remove them. Evidence of tattoo removal using dermabrasion has been found on Egyptian mummies dating back 4300 years [2]. Over recent years the popularity of tattooing has increased along with its availability and ease. Now some 20% of all British adults have some form of tattoo. That number increases to 29% if you examine 16–44 year-olds alone [3]. Alongside this increase in the number of tattoos there will always be a proportion of people who regret their tattoo. In a 2011 survey of Italian adolescents 44% of interviewees reported regretting having their tattoo, with 26–33% of them considering tattoo removal [4]. These people cite reasons such as physical appearance, end of a relationship, peer and family pressure, as well as end of group or gang affiliation and desire for increased employment options for tattoo removal. With this vast number of people seeking removal there is an increasing correlating market for tattoo removing methods and products.

As persons investigate tattoo removal they will often turn to the internet and their local tattoo parlour for advice regarding removal. The options are largely split into laser, removal creams (chemical burn), and branding. Laser is a safe and effective method of tattoo removal. It has been shown to be extremely effective for a large number of tattoo types and colours. It does, however, often require a prolonged course of treatment with anything from 5 to 20 treatments to achieve complete resolution and it's availability on the NHS is limited and dependent on evidence of psychological harm being caused by the tattoo and local trust policy. As such the cost of at least sixty pounds per session can be prohibitively expensive for many people seeking private care. They therefore understandably seek cheaper and quicker options. Some positive results have been shown with different chemical burn removal techniques, such as application of trichloroacetic acid [5]. This work has led to a wide number of topical creams being available online. These creams often make remarkable promises, while their ingredients are sometimes uncertain and therefore have varying results. These products, often purchased from unlicensed websites were, found to have limited instructions and varying outcomes. Included in their outcomes is the risk of a severe chemical burn [6].

These limited options have led people to turn to their local tattoo parlour for treatment and advice. One choice which has become more popular over the last few years is branding. This involves heating of the skin to cause a thermal burn which once healed is supposed to cause a reduction in the tattoo. This method seems to be an offshoot from the increasingly popular branding form of tattoo where people burn themselves in a prescribed pattern to give a scarred pattern effect.

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In the circumstances of this case, the burn was caused with a surgical diathermy set on a man seeking tattoo removal.

2. Case presentation

A 32 year old man with dense tattooing to both arms, from dorsum of his hands to shoulders, presented to our unit having had an attempted removal of the tattoos four days prior. He had attended a local tattoo parlour that offered tattoo removal by 'branding'. The tattoo artist used a Conmed Hyfrecator 2000 electrosurgical unit in monopolar mode, without a dispersive plate, to apply heat to the dorsum of the right wrist, thumb and the proximal phalanges and metacarpophalangeal joints (MCPJs) of the third and four digits (Figs. A–D). The patient described his hand as 'smoking' and stated that severe pain and swelling started the same day. The procedure was only limited because the patient asked for it to stop due to pain and the smoking.

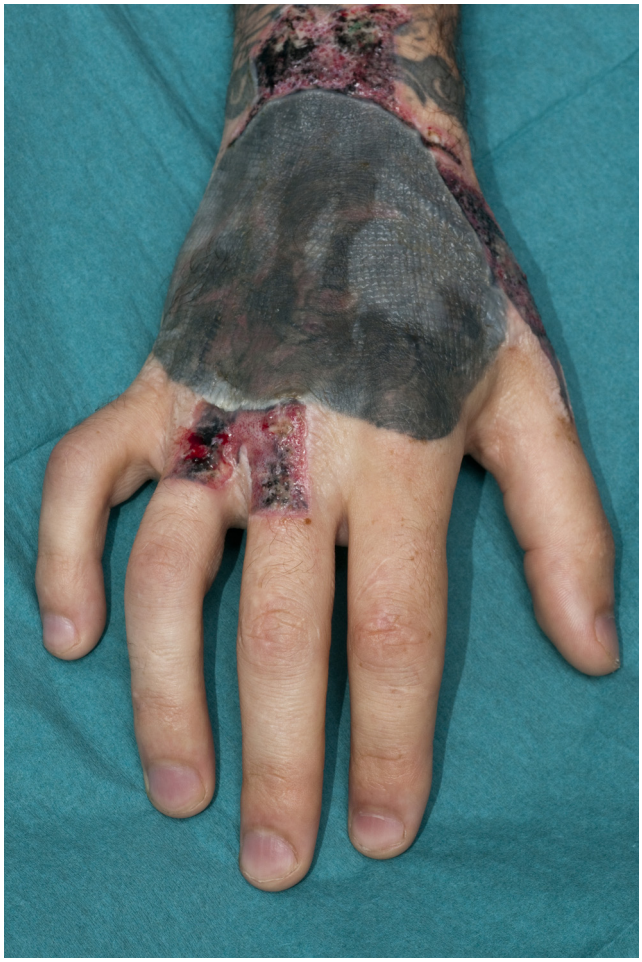

Fig. 1 – Photograph of the affected area which was taken at initial presentation, four days after injury. The area was cleaned prior to being photographed and shows mixed depth, including deep dermal, burns on dorsum of hand and wrist. There is also an area of increased tattoo pigmentation on the dorsum of the hand between the burns which was the intended area of the first treatment.

The patient was then referred to us by his GP due to increasingly painful wounds and reduced range of movement to his right wrist and MCPJs. On examination the dorsum of the right hand was swollen, red and tender. There was mixed depth (superficial and deep dermal) to dorsum of the wrist, thumb 3rd and 4th digits (see Fig. A). This is in the exact distribution of the electrosurgical treatment he received. The burns were purulent. He was unable to make a fist and also described reduced sensation to tips of his fingers.

The patient was treated with analgesia, flamazine dressings, splint, oral antibiotics, regular hand physiotherapy and daily review and dressing changes in our burns outpatient dressing clinic. He was seen over the next three weeks with appointments every few days to monitor the extent of the damage, and whether a skin graft would benefit. Though it was slow to heal (see Fig. B), the wounds eventually healed without surgical intervention (Figs. C and D). However he represented after 7 months with hypertrophic scarring and compression of the superficial branch of the radial nerve, for which he underwent local scar excision, direct closure and steroid injections. At follow-up 4 weeks later there was scar healing with only mild hypertrophy unfortunately the pain was not resolved. The on-going issues regarding this chronic pain lead to depression and the need for referral to pain clinic and psychiatry.

3. Discussion

Decorative tattooing is getting increasingly popular and, with it, the publics' demand for tattoo removal; one paper estimates that up to 50% of all people with tattoos regret them later in life [7]. Recent papers looking at the factors that motivated and deterred adolescent from getting tattoos found that it was the pain and difficulty of removal that had the greatest influence [8]. This was certainly true before the advent of laser therapy in the seventies, when methods of tattoo removal centred on the use of dermabrasion, creams, caustic sodas and excision for smaller tattoos [9,2]. There has been much reported about the detrimental effects of these methods as well as their unreliable results [10,11]. Recent case reports demonstrated on-going use of these substances bought off the internet with little reliable advice, information or regulation [11].

Laser therapy is the only method of thermal tattoo removal that the authors could find in the literature. Although this was initially with the argon laser, the use of carbon-dioxide lasers and now the Q-switch approach, have made this method safe and effective [12,13,14]. However, there are regulations on the provision of this 'non-essential' therapy in the NHS. The NHS modernization agency has stipulated that this should only be provided in the cases of tattoos inflicted against the patient's will, so called 'rape tattoos'; if the patient was not Gillick competent at the time or tattoos inflicted under duress in adolescence or disturbed periods [15]. It is also prohibitively expensive in the private market, often requiring multiple treatments. Q-switch laser treatment is now available in many tattoo parlours but under non-medical practitioners and, therefore, potentially carry increased complication rates as a result. Severe bodily harm and poor counselling and