



## Treating Acne Scars with Lasers

**Practitioners discuss patient concerns surrounding acne scarring and how they treat the indication using laser devices**

**Patients of all ages can suffer from the burden of acne vulgaris. Approximately 85% of people between the ages of 12 and 24 experience at least minor acne.<sup>1,2</sup>** However, even when the acne finally subsides, for many patients, this is not the end of their concern. Patients can be left with permanent atrophic and/or hypertrophic scars lasting into adulthood. These scars, much like the acne itself, can cause deep psychological distress, making the scarring just as important to treat as the acne.<sup>2</sup>

According to practitioners interviewed for this article, there are many approaches to treating scarring caused by acne, including chemical peels, microdermabrasion, microneedling, dermal fillers, and devices such as radiofrequency and laser.<sup>2</sup> With the advancement of laser technology, this article will discuss the use of fractional ablative and fractional non-ablative lasers for the treatment of acne scarring.

### Acne scars

"Acne scarring is due to prolonged inflammation of the skin caused by acne, but it does not appear to be linked directly to severity,"<sup>2,3</sup> explains consultant dermatologist Dr Maria Gonzalez. She adds that patients with severe acne who have been treated appropriately without delay and with drugs such as oral isotretinoin to clear the acne, may not necessarily result in scarring,<sup>2</sup> but also notes that, "There does seem to be a genetic link between those who scar and those who do not scar and it's not always predictable – some people just genetically respond to inflammation in a way that produces scarring."<sup>4</sup> Consultant dermatologist Dr Firas Al-Niaimi adds, "A strong family history, nodulocystic and severe acne, those who have been left untreated and those who have been manually squeezing their spots are at risk of developing acne scarring."<sup>2,3,5</sup> Specialist dermatology nurse and independent prescriber Isabel Lavers says she doesn't believe acne scarring is gender specific. She says, "It affects both sexes and even though I often hear people say that men's backs get worse scarring, I've seen many girls who have had acne and been

Keloid

Rolling

Boxcar

Ice Pick

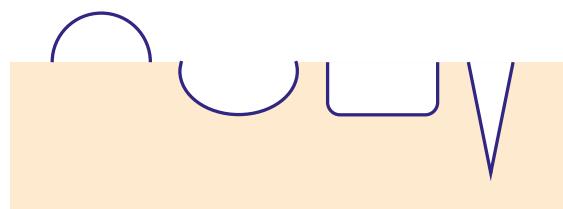


Figure 1: Type of scars that can be caused by acne<sup>2,4,8</sup>

left with severe scarring affecting their backs."

Aesthetic surgeon Mr Benji Dhillon says that darker skin types can have a higher risk of poor aesthetic outcomes following acne, due to the risk of post inflammatory hyperpigmentation (PIH), which they are more susceptible to.<sup>2,6</sup> He also explains that acne scars are predominately found on the cheeks, the temples, the forehead, sometimes along the jawline and on the back.<sup>2</sup> "If they have bad facial acne they may have some on their back, but it's not often the first thing that patients get treated – they like to get their face treated first," he acknowledges.

Typically, there are three types of acne scars: ice pick (more deep than wide), boxcar (wider than deep with distinct edges) and rolling (can be smoothed out if stretched) atrophic scars.<sup>2,5</sup> In some cases (particularly on the chest and shoulders) hypertrophic or keloid scars can result from acne and these are generally treated with other options than the atrophic acne scars. (**Figure 1**).<sup>2,5</sup> Mr Dhillon explains, "Ice pick scars are traditionally very difficult to treat given their physical characteristics. Boxcar scars and rolling scars, although not easy to treat, are slightly more amenable to some of the treatment options such as lasers."

### Why choose lasers for acne scarring?

In order to improve the appearance of an acne scar, the aim of laser treatment is to stimulate the skin to produce collagen through creating a wound in the epidermis. Aesthetic practitioner Dr Andrew Weber explains, "Fractional lasers produce micro thermal zones of coagulated tissue, allowing for resurfacing, collagen stimulation (of a non-scar type) as well as skin tightening due to the heat produced."<sup>9</sup> Dr Al-Niaimi believes that lasers are a good option due to the added control you get over other treatment methods. "The advancement in laser technology allows us to create a form of controlled injury into the skin to the depth that is required. For example, if you have shallow scars then we can control that depth of injury into the skin at a shallow level and, in the case of deep scars, we can create a controlled injury at a deeper level," he explains.

Mr Dhillon agrees, "I personally like using lasers because I am able to tailor treatments to the type of scarring and to the type of patient in terms of their expectations and downtime. One of the

concerns you always have with any form of treatment where you are making an injury to try and improve skin is PIH. I know that if I am using a laser device, although I can never rule out PIH, I will have a degree of control over the settings I use.”

The two main forms of laser devices for acne scarring is fractional ablative and fractional non-ablative, explains Mr Dhillon, who says that, “Fractional ablative lasers target various layers of the skin whilst also creating an epidermal injury.” He continues, “For non-ablative you are also targeting various layers of the skin but without an injury to the epidermis.”<sup>9</sup>

### **The consultation**

Practitioners interviewed agreed that a comprehensive consultation is needed, including an assessment of the types of scars, skin characteristics, including skin type and thickness, and treatment history. Lavers adds, “If they’ve been on oral isotretinoin they must wait a number of months before we can consider treatments because the skin is still fragile.” Practitioners also note that the psychological impacts of the condition must be considered alongside the patient’s expectations and treatment downtime. Mr Dhillon says, “The most challenging part of the acne scarring treatment process is actually dealing with the patient’s expectations – they require a degree of counselling – scarring is not just physical but is also a psychological issue. As a practitioner, you have to really probe into how this affects them.” He advises to look out for ‘red flags’ and make sure the patient understands the level of results that will be achieved, emphasising that, “We should never promise an outcome.”

Dr Gonzalez says that when determining the appropriate treatment, it is vital to understand the patient’s lifestyle and expectations in the consultation, especially for the more aggressive treatments with long downtime such as the ablative lasers. “I always show my patients pictures of other patients post-procedure to demonstrate what they will look like before they commit to their treatment – that’s how they decide if that’s something they can tolerate or not,” she says.

Lavers adds, “Once the patient is scarred it is so difficult to reverse, often impossible, but one aims to improve the appearance of the scar to a point that the patient feels much better about their appearance. I often say to people ‘I can’t magic your scars away but I can hopefully make them look a lot better.’”

### **Radiofrequency**

Unlike laser, radiofrequency produces an electrical current as opposed to light that is passed through the dermis to produce small thermal wounds, which stimulates dermal remodelling to produce new collagen.<sup>8</sup>

Lavers and Dr Gonzalez believe this method is also worth considering for treatment of acne scars. Lavers explains, “I like radiofrequency because the downtime is quite minimal. The main damage that occurs is in the dermis, which is pretty much untouched, where the remodelling of the collagen in the skin takes place and not on the skin’s surface.”

Lavers says the energy levels of radiofrequency devices can be adapted to cater for different patients and their scar severity, “If you have patients with skin of colour, you have to be more careful because any trauma you cause can equally trigger PIH, so if you have darker skin types you tend to stay at the lower energy levels, but when treating patients with Caucasian skin one is able to use higher energy levels, which are required for more severe acne.” Typically, she says her patients usually require three to four treatments, and the optimal results are seen around three months after the final treatment. She explains that, post-treatment, patients may see redness and a bit of fine scaling but that this can be covered with makeup.

Dr Gonzalez explains that the ideal patient to treat with radiofrequency would be, “Anybody with scarring, including ice pick scarring, once they are aware that they can expect about 25-30% improvement. I often use radiofrequency in patients whom are not suitable to start on aggressive treatments such as a CO2 laser. A notable group would be patients with pigmented skin, of whom post treatment hyperpigmentation is very likely when ablative treatments are used. The incidence of post treatment pigmentation is less likely with radiofrequency if appropriately carried out.”

### **Fractional ablative**

“Out of all the acne scarring treatments, deep peels and fractional ablative lasers probably give the best results,” says Dr Gonzalez. Ablative lasers generate beams of light that are absorbed by the skin as energy, which is delivered through a range of wavelengths.

The two fractional ablative lasers most commonly used for acne scarring are CO2 and erbium yttrium aluminum garnet (Er:YAG) lasers.<sup>7</sup> The CO2 device emits light in the infrared range at a wavelength of 10,600 nanometres.<sup>7</sup> Mr Dhillon explains, noting that it aims to act on the superficial layers of the skin, “It works by using water as a chromophore, which sits in the skin so you can generate an injury in the deeper layers to stimulate collagen and try and improve scarring from within.” Dr Al-Niaimi notes that the CO2 is ideal for more impact and tightening, but says that it is a more aggressive treatment with a longer downtime. He explains, “There will be ablation but there will also be some residual heat around the ablative area

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Dr Firas Al-Niaimi, consultant dermatologist

which we could call the coagulation zone, but because of this there is going to be a longer downtime." He says practitioners must be careful with skin of colour and thin skin, saying, "For thinner skin you have to be more careful and will need to use lower settings. For thicker skin you can use a higher setting and be more aggressive if the scars are deep." Dr Gonzalez notes that CO<sub>2</sub> lasers are her preference for ablation because, "The Erbium doesn't penetrate as deeply into the skin as the CO<sub>2</sub> laser so if you want a better result you should use a CO<sub>2</sub> laser. However, some practitioners have perfected the use of erbium lasers in acne scarring by using multiple passes, which increase the penetration of this laser. For fractional ablative lasers treatments every three to four months are recommended and patients should expect to have at least three treatments in a year in order to see results." In addition, she notes, that the downtime can be from seven to nine days. Conversely, Dr Weber says, "We do not use a CO<sub>2</sub> laser because of the downtime." For ablation, he would instead use a fractional Er:YAG 2940 nm laser, "The treatment is not optimal but the downtime is minimised. Today's patients require minimal downtime and although with the 2940 nm there is some swelling and redness, it is easily covered by makeup. Most self-conscious acne scarring sufferers are young and have full time jobs so are unable to tolerate downtime."

### Fractional non-ablative

Dr Al-Niaimi points out, "It's not just the fractional ablative to consider, I also use a lot of fractional non-ablative for acne scarring." He says that the results of non-ablative systems are somewhat inferior to the fractional ablative but do have some benefits, "They usually require more treatments compared to the fractional ablative but they are associated with less downtime and less risk of PIH – they are for mild to moderate acne scarring and the results can be very acceptable." Dr Al-Niaimi notes the common wavelengths for the fractional non-ablative that can be used for acne scarring are 1540 nm, 1550 nm and 1565 nm. He says his choice of using a fractional non-ablative device will be based on the patient's preference, severity of the acne scarring and if they want a reduced downtime. He says patients will usually require from three to five treatments, with two to three days of downtime, "I generally explain that the results are gradual and that they may require lots of treatments, depending on the severity of the scars," he says. Mr Dhillon also uses non-ablative devices in his clinic based on the patient's preference and would consider a non-ablative device if the patient can't afford the downtime associated with ablative lasers. He says, "I always counsel them and say that they will require more sessions than you would an ablative device, but saying that, we are actually starting to use less of the fractional non-ablative devices and more of the fractional ablation."

### Lasers in combination

"Lasers are one option for acne scar treatments, not the sole option," Dr Al-Niaimi explains, saying he will often use combination treatments for optimum results. Choice of combination treatments, he says, "Depends on the type of acne scarring and sometimes the size – I often combine lasers, excision and subcision for some of the deep rolling scars, and I might combine that with some fillers after the laser treatments for some of the atrophic areas where there is tissue loss." Mr Dhillon has some experience using dermal fillers for resistant ice pick scars, but says, "Personally I don't like using fillers for acne scars because they are a short lived improvement – fillers break down – so it comes back to the patient's expectations of treatment."

**"Out of all the acne scarring treatments, deep peels and fractional ablative lasers probably give the best results"**

Dr Maria Gonzalez, consultant dermatologist

Dr Gonzalez says she will consider a number of treatments with laser for acne scarring, "What you are trying to do is stimulate collagen in the dermis – you can use lasers to achieve this, you can use peels, microneedling, or radiofrequency. It is also useful to combine any or all of these treatments. If combining treatments care is required in the timing of different treatments in order to minimise the risk of complications." Mr Dhillon also emphasises the importance of skincare, "It's probably just as important as the device-based treatment. I'd get the patient to start making sure that they are consistently using sun protection every day before and after treatment." He would also introduce a vitamin C serum, explaining, "It has been suggested to prolong and improve the benefits of treatment and prevent the break down of collagen."<sup>8</sup> Dr Al-Niaimi adds, "If you use vitamin C after fractional ablative lasers you get quicker healing, less downtime and you also stimulate more fibroblasts."<sup>8</sup>

### Conclusion

When determining acne scar treatment, it is important for practitioners to take note of the type of acne scar and the downtime associated with the treatment. For practitioners considering treating acne scars with laser devices, Mr Dhillon advises, "I think the most important thing is not to be afraid to say no to patients, and also understand their desires and wishes rather than just focusing on their physical needs when it comes to acne scarring." Dr Al-Niaimi concludes, "It is very important to have photographs before the treatment to monitor the results. Be very confident and familiar with your machine and constantly remind yourself of other technologies and treatments. Lastly, it's really important to understand that acne patients have been thinking about this for a long time and this is a really important thing for them – showing some compassion can go a long way."

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