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Improvement Keloid Scar in Child with Skin Type Fitzpatrick IV after Combination Therapy: A Case Report

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ABSTRACT

A keloid is a fibrous growth that forms when the skin's immune system reacts abnormally to trauma. Patients experience a diminished quality of life due to the cosmetic disfigurement and functional impairment caused by keloids. The recurrence rate is high, and keloid treatment is still challenging. The patient is a 16-year-old boy with a keloid history that dates back 2 years (Fitzpatrick IV). Thickened skin on the patient's trunk and left shoulder, together with itching, was the source of the patient's cosmetic complaints. This case was successfully treated by combination with one session of fractional carbon dioxide (CO2) laser and three sessions of triamcinolone acetonide injection. This is the first case report of a child (Fitzpatrick IV) who was successfully treated for a keloid utilizing a combined therapy of fractional CO2 laser and triamcinolone acetonide injection, with great cosmetic results that lasted one month after treatment. For patients with keloids on their face (Fitzpatrick IV-VI) and other skin types, we think this combined treatment strategy has a good chance of being safe and successful. This case demonstrates how the combination of fractional CO2 laser and intralesional steroid treatment results in a more efficient and successful therapy for keloid scars, as well as an improvement in patients' quality of life.

Keywords: Child, keloids, Fitzpatrick IV skin type, skin color, CO_2 laser, triamcinolone acetonide, case report.

1. INTRODUCTION

Typically appearing between the ages of 20 and 30, keloids are fibrous growths that arise from an abnormal reaction to skin damage. The frequency is particularly high among people of color [1], [2]. Clinically, keloids manifest as nodular, solid lesions that spread beyond the site of the original injury, do not go away on their own, and often even become larger with time [1]. High skin tension areas, including the trunk, shoulders, and upper arms, are typically impacted [3]. Despite their innocuity, keloids can deform the skin and impair bodily functions, lowering patients' quality of life. Keloids are reported to cause pain, pruritus, and burning [2].

Despite the fact that there are numerous therapeutic alternatives accessible, keloids remain difficult to treat. Current treatment options include compression and silicon sheeting, in addition to surgical procedures, intralesional bleomycin, 5-fluorouracil, interferon, intralesional steroids, topical imiquimod, and other pharmaceutical treatment [4]. Recurrence rates are high (about 50-80%), even when using combination medications, and treatment success rates can vary widely [4]. Intralesional steroid injections as monotherapy for keloids had higher recurrence rates and more negative effects than combined therapy [5]. Skin shrinkage, telangiectasia, hypopigmentation, scar widening, and delayed wound healing are some of the adverse effects linked to steroid injections, which have been reported in as many as 63% of patients [6]. There is limited published evidence on the treatment of keloids with a fractional CO_2 laser and topical triamcinolone acetonide. The CO2 laser vaporizes tissue via absorption of light at a wavelength of 10,600 nm. Microthermal zones, created by the fractional CO2 laser's ablated tissue columns encircled by intact skin, can speed up the healing process and promote tissue regeneration [7].

This case reported a 16-year-old male child (Fitzpatrick IV) with a 2-year history of keloid. the patient also mentioned the unsightly thickening of the skin on the trunk and left shoulder and itching, it was successfully treated by one session of fractional CO2 laser combined with three sessions of triamcinolone acetonide injection before and after CO_2 laser.

Patient and observation

Patient information: A child 16-year-old male (Fitzpatrick IV) visited the dermatology clinic for treatment of keloids on his trunk and left shoulder after developing a varicella infection about 2 years ago. Figure 1 shows the patient's complaints of itching and thicker skin on the trunk and left shoulder, which they found aesthetically unappealing. The patient had previously experienced the same complaint at the age of 5 years, didn't improve after being injected. The patient's family didn't have the same complaint.

Figure 1. Before Treatment

Clinical Findings: Based on examination in thoracic anterior et brachii sinistra region, we found multiple papules, similar color with the skin, size 1 cm in diameter, discrete, firm consistency (red circle).

Timeline: Initially the patient suffered from varicella zoster 2 years ago, then there were scars on the chest and left arm from the vesicles that burst forming scar tissue. Over time it thickened, itched, turned darker and disturbed the appearance. He had never been treated for his current complaint before.

Diagnostic assessment: Biopsy, superficial ultrasound or magnetic resonance imaging were not performed because the patient refused because it was not covered by insurance. The dermoscopy examination result showed serpentine blood vessels, grey area and a smooth, shiny surface related to keloid stages 1A. Small keloids generally have a lower risk of recurrence.

Therapeutic intervention: The patient was treated once with a fractional CO_2 laser and three injections with triamcinolone acetate 10 mg/ml. Injections with triamcinolone acetate were given in the first week, third week, and fourth week. A fractional laser CO_2 fluent 10,2 Mj/cm^2 with a spot size of 0,5 mm was given in the second week. Before the laser procedure, anesthetic cream was given for 30-45 minutes. During therapy, there is no change in dosage.

Follow up an outcome: Every week, patients are checked on time, and we evaluate the patient's complaints and objectives. One month after treatment, the keloids showed a significant decrease in thickness, size 0,5 cm in diameter, and an improvement in texture and overall aesthetic appearance, resulting in high patient satisfaction (Figure 2). Evaluation by dermoscopic examination did not reveal any abnormalities. As a result, it can be concluded that this therapy has no negative side effects for patients.

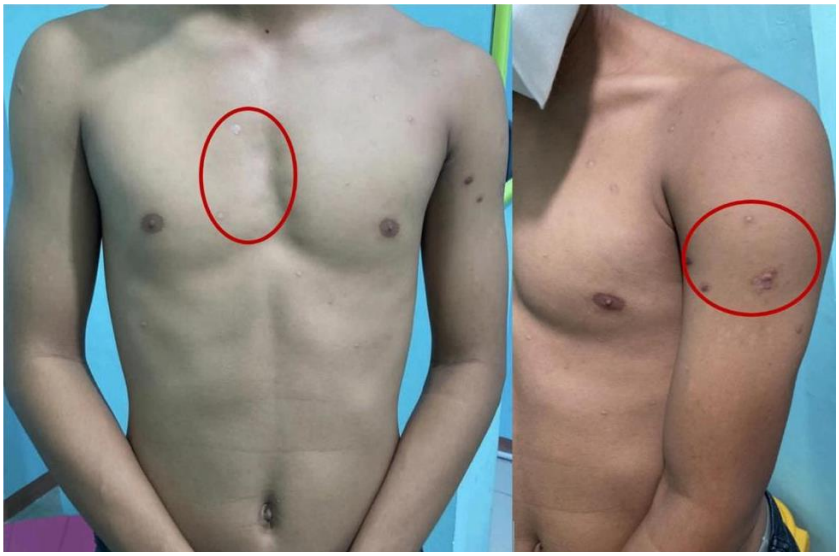

Figure 2. One Month after Treatment

Patient perspective: He reported subjective "scar smoothing" and was "delighted" with the results without complications or side effects.

Informed consent: The patient gave their written informed consent before the publication and any related photos may be made.

2. DISCUSSION

Keloids can have a major negative psychosocial impact on patients due to their aesthetically unappealing appearance and related functional limitations, resulting in a lower quality of life.[2] Different treatments have been used for keloid, among which are: surgical excision with or without grafting, pressure therapy, interferon, topical and local corticosteroids, local bleomycin injection, and laser therapy [8].

Physicians recommend intralesional steroid injection as the primary therapeutic option.[9] Steroid injections have been shown to cause scar regression with their anti-inflammatory effects, increasing tissue hypoxia and decreasing fibroblasts leading to decreased synthesis of collagen and glycosaminoglycans [8]. Triamcinolone acetonide (10-40 mg/ml) is the most commonly used steroid in scar treatment, either alone or in combination with lidocaine to minimize pain; treatment requires once or twice a month sessions [9].

According to published evidence, non-fractional CO_2 lasers are not ideal for keloid therapy due to the significant risk of keloid CO_2 lasers are frequently used by dermatologists and other doctors today, and they offer considerable advantages over non-fractional CO_2 lasers, such as shorter downtime, a lower risk of infection, bleeding, and dyschromia, and less patient discomfort. Fractional CO_2 lasers reduce collagen density in several ways. It increases fibroblast proliferation but decreases TGF-β, which plays a crucial role in collagen formation. It also shortens collagen fibers to one-third of their original length. A fractional CO_2 laser produces an MTZ depth of approximately 400μm. The depth has reached the papillary dermis, allowing MTZ to serve as a depot for the dispersion of injected triamcinolone acetonide. The collagen density decreased more significantly after fractional CO_2 laser-triamcinolone injection combination therapy of keloids for Fitzpatrick IV skin color, only one session is required to achieve clinical improvement [1]. A gradual approach when treating keloids on skin of color, it is critical to be aware of the potential negative effects. Combination therapy with fractional CO_2 laser and intralesional steroids in the treatment of keloids provides a synergistic effect. This combination therapy is more effective and efficient than single therapy. Excellent cosmetic results in patients with keloids, with no recurrence or serious side effects, as well as more rapid recovery.

3. CONCLUSION

The case report details the successful combination of treatment with fractional CO_2 laser and intralesional steroid produces an efficient and more effective therapy in the treatment of keloid scars actually in child with skin type Fitzpatrick IV and can improve the quality of life for patients.

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