Laser Combined with Radiotherapy for Keloid Treatment: A Novel and Efficient Comprehensive Therapy with a Lower Recurrence Rate

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BACKGROUND:

Keloid is a kind of benign skin fibroproliferative disease with a high recurrence risk. At present, comprehensive therapy is commonly used in treatment, but the high recurrence rate is still an urgent problem to solve. Moreover, the existing comprehensive treatment methods also have various problems, such as high cost, complex process, multiple side effects and so on.

METHODS:

99 patients with keloids who received ablative fractional carbon dioxide laser combined with radiotherapy (LCR) from February 2018 to November 2019 were studied and analyzed retrospectively. The LCR treatment was composed of one session of ablative fractional CO_2 laser and two sessions of electron beam irradiation. The patient received ablative fractional CO_2 laser first with an energy range of 360−1008mj. Radiotherapy was performed with 6MeV electron beam secondly. The first pass was completed within 24 hours after laser therapy, and the second pass was completed on the 7^{th} day after that. 9Gy energy was used for radiotherapy. The efficacy was evaluated by Patient and Observer Scar Assessment Scale (POSAS) before treatment and 6, 12 and 18 months after treatment. At the same time, the recurrence, side effects and satisfaction with the results were evaluated by online questionnaire.

RESULTS:

The total POSAS scores at 18 months follow−up was significantly lower than that before treatment (31.3 ± 11.0 vs 61.5 ± 13.7, P < 0.0001). During the follow−up period, 12.1% of the patients had recurrence, of which 11.1% had partial recurrence and 1.0% had complete recurrence. The overall satisfaction rate was 97.0%. No serious adverse reactions were observed during follow−up.

Table1. Patient and Observer Scar Assessment Scale before and 18 months after the therapy

	Before Treatment	18 Months after Treatment	P-value
Total Score	61.5±13.7	31.3±11.0	<0.0001
Patient Score	38.6±10.8	19.5±9.8	<0.0001
Pain	3.4±2.6	1.6±1.2	<0.0001
Pruritus	4.6±2.7	2.2±1.6	<0.0001
Color	8.2±2.2	4.6±2.7	<0.0001
Stiffness	7.5±2.4	3.9±2.5	<0.0001
Thickness	7.7±2.6	3.7±2.6	<0.0001
Irregularity	7. 3±2.5	3.6±2.3	<0.0001
Observer Score	**23.0±6.0**	**11.7±3.0**	**<0.0001**
Vascularity	3.6±1.6	1.8±0.7	<0.0001
Pigmentation	6.2±1.8	2.5±0.7	<0.0001
Thickness	4.1±1.7	2.2±0.8	<0.0001
Tension	4.5±1.7	2.5±0.8	<0.0001
Elasticity	4.5±1.4	2.5±0.7	<0.0001

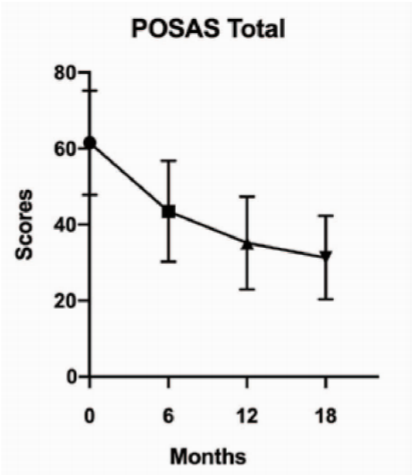

Fig 1. Patient POSAS total score changes before (T0),6 months (6M), 12 months (12M), and 18 months (18M) after the treatment. The figure indicates a significant difference between follow–up moments ($p<0.0001$).

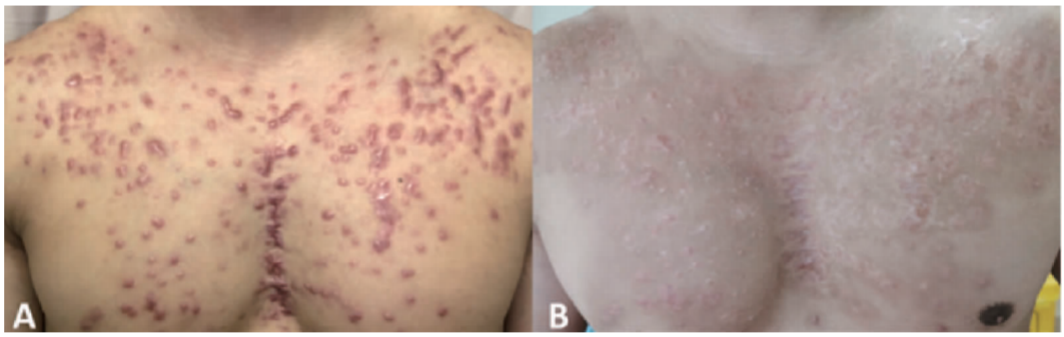

Fig 2. A 30–year–old male (case 57) with multiple keloids developed from acnes on the anterior chest for 1 year (A); 18 months after LCR therapy (B).

CONCLUSION:

LCR is a new comprehensive treatment for keloid which has not been reported by other scholars yet. The research results show that it has the benefit of good curative effect, low recurrence rate and high safety. This paper provides a theoretical basis for widely developing this method clinically.

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