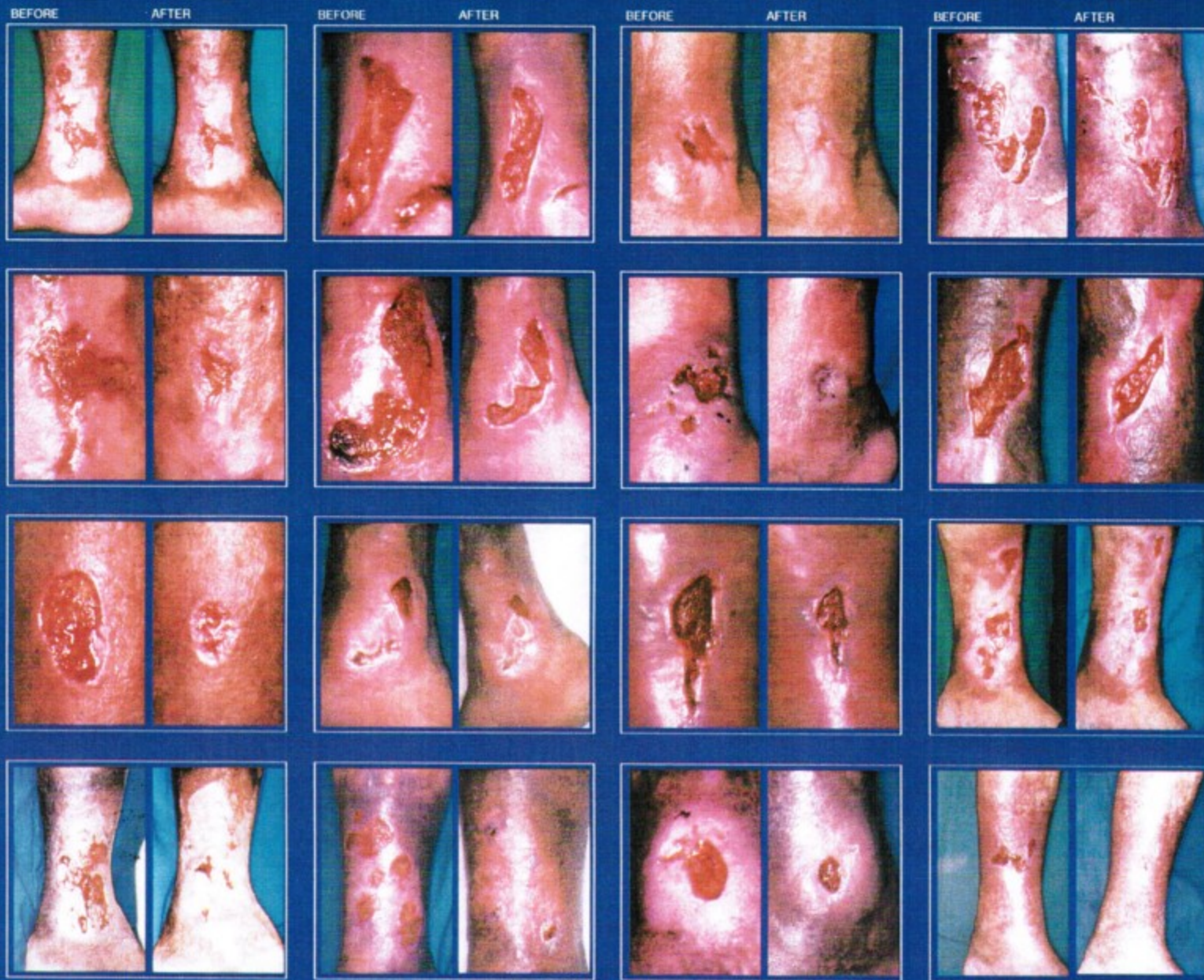


USE OF POLARIZED LIGHT THERAPY (480-3400 nm)

IN THE MANAGEMENT OF VENOUS LEG ULCERS: A PILOT CLINICAL STUDY

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OBJECTIVE

The biostimulative effects of the light in wound healing and repair have been widely published. The use of light in promoting ulcer healing, as an adjunct to, or in absence of other proven therapies was advocated by many investigators. The aim of this study was to assess the effectiveness of polarized polychromatic non-coherent light therapy in treatment of venous leg ulcers.

METHODS

LIGHT SOURCE The equipment used in our study is a non-invasive and non-thermal optical device with patented technology based on the biostimulative effects of polarized non-coherent light in the visible and infrared spectrum (**Bioptron 2TM**, Bioptron AG, Switzerland). The physical parameters of the output of this light unit were as follows: wavelength 480-3400 nm; spot size 254 cm², average power density 40 mW/cm² (at the distance of 10 cm). At each treatment session a patient received an average fluence of 19.2 J/cm².

INTERVENTION All 25 patients were treated with light only. Phototherapy treatments were given once a day for eight minutes during four weeks. Thus, each patient has received a total of 28 irradiation treatments at the end of the study. The light device was kept at the distance of 10 cm from the skin surface. No other therapies that may enhance healing of the ulcers were permitted during the entire study. The only concomitant therapy consisted of daily rinsing of ulcers with saline followed by simple sterile dry dressing.

WOUND ASSESSMENT Wound assessment was done before the treatment and every week thereafter up to a total course of four weeks. This primarily involved measurement of wound surface area (ulcer size). A transparent disinfected plastic film consisting of two sheets was placed over the ulcer. The boundary of the ulcer was outlined with a fine-tipped indelible marker pen on the top sheet. Computerized planimetry was performed then on tracings directly taken from patient's ulcers by using a Planix 7 Digital Planimeter (Tamaya Techniques, Inc., USA). All measurements were performed three times and a mean value of ulcer size was calculated.

RESULTS

A total of 25 patients were enrolled in the study. The study comprised 21 men (84 %) and 4 women (16 %). Mean patient age was 61.9 (ranging from 46 to 84 years). The total number of leg ulcers at the beginning of the study was 73. The mean initial ulcer size was 26.45 cm² (SD 24.6, range from 1.45 cm² to 94.66 cm²). All patients completed the study.

All ulcers except one (98.6 %) had a positive value for the change in healing area at the end of four weeks. 22 ulcers (30.1 %) completely healed by four weeks. Mean ulcer size after four weeks of treatment statistically significantly reduced to 12.79 cm² (SD 18.2, range from 0 cm² to 84.5 cm², $T = 4.09$, $p < 0.01$). The decrease of the wound surface area after the treatment was statistically significant (mean 57.15 %, SD 31.87 %).

The total numbers of ulcers after four weeks was 51 ($T = 3.77$, $p < 0.01$)

Mean overall healing rate was 3.53 cm²/week (SD 4.1, range -0.052 to 19.34).

No adverse side effects were observed.