The Possibility of Healing Deep Wounds in Rats Using Helium Neon Laser

Rabab Hajwal Al-Zamily

M.Sc. Physics/ Lecturer, Department of physiology and medical Physics College of Medicine, Al-Qadisiyah University, Iraq

Abstract

Laser treatment is generally used for tissue restoration. Restorative soft tissues include objective, practical and difficult responses.

The goal of the research have being to estimate the irradiation capabilities the helium neon laser irradiation on three different types of wounds depth.

Sixty young male rats were used in this study, divided into three groups. (20 per group) Wounds were created with different depth for the first, second and third group have been irradiated by the laser using He-Ne energies flowing 4 minutes, five out of twenty animals left without radiation is considered to control.

Biopsy was taken from all rats for histological examination at 1, 3 and 7 days after surgery. The results showed a clear enhancement of treatment wounds from control, Helium neon laser failure in the treatment of very deep wounds.

Key words: *laser treatment, deep wounds, wound healing*

Introduction

Laser therapy is a procedure to obtain the improvement in medical treatment body, acupuncture, dentistry, veterinary practice involves the recruitment and refers to the relationships between the laser and biological tissue radiation monochromatic light in biological tissue to get the effect biomodulative within the soft tissue.[1,2]

Investigation effects have varied for various reasons, including the use of different doses of the waves and the use of animal models healthy[3].

It has been improved wound remedial by applying of laser power [4]. An assuring analyses for laser to stimulate the healing of ulcers and other wounds on the skin involved[5].

Produces laser radiation modified dynamically, which means that it can stimulate or discourage. So can be laser low dose is ineffective, while the excess energy may prevent healing rather than stimulated. Can treat acute injuries frequently (daily) [6]

Although accelerating tissue healing, the effects of hyperplasia did not appear. During the healing wounds of the laser contained a larger amount of collagen and tensile strength. Therefore, when using health goals, the results may be silent [7].

In spite of several intelligences of certain effects after examinations led in the test center, in animal styles and in medical randomized regulated ordeals, is motionless provocative LLLT[8].

The influence of the laser be contingent on the energy intensity, exposure period and radiated area. The laser wavelength affects the depth of the energy

Corresponding Author:
Rabab Hajwal Al-Zamily
Emil: rabab_alzamily@ yahoo.com.
rabab.alzamily@qu.edu.iq
07801595543, 07831152861

penetration[9].

Applying low levels of visible light to reduction pain, inflammation and promote wound remedial, tissue and deep nerves, and avoiding soft tissue harm[10].

Studies have shown the number of negative results and positive

The application of laser irradiation technology, He-Ne daily on the wounds till healing has occurred to verify the full deductions at a low level energy by reducing injuries[11].

Researchers emphasized that tissue restoration develops extra active when dealing with low-level laser. They exposes that the laser beam catalyze create of the fibroblast growing element and the frequency these cells. Exposure to chromatic laser radiation faster the remedial procedure, with better collagen fibers increases collagen installation, along per earlier epithelial[12].

Through our previous studies on radiation wound treatment (The study includes the first research of wound healing using laser helium neon confidential 1 cm depth and a length of 1 cm and the second by argon laser) indicating an important speeding in the field dynamic of range OF wound remedial[13, 14], This third paper examines the efficiency of He- Ne laser in treating deep wounds so I dealt with three types of wounds of different depths.

Materials and Method

The use of continuing helium neon laser mechanism made in China type of (Jgq) no. (250) a radiation-point 2 mm in the radius of the wave length from 632.8 nm and power 85×10^{-3} W.

Sixty young rats male, age of less than five months, weight approximately of less than fifth hundred gram be there operated applied. Rats have being distributed about three groupings (a), (b), (C). A surface wound 10mm distance be prepared at Thigh all anesthetize rats into all groupings, but the depth was made into (11-15) mm in the first group a, and (15-20) mm second group b, third grouping was performed on (20-30) mm.

All rats in the cage were clean net to prevent pollution.

All Groups (a), (b) and (c) contains (20) rat, fifteen rats exposed using laser helium neion of Energy 0.2 J (Energy Density = (0.2) / (0.126) = (1.6) J/cm^2) for 4 min. Another five Non-radioactive animals were considered as a controller grouping. A biopsy of all rats was taken for histological Test analysis at 1, 3 and 7 days after surgery. Tissue Test analysis histopathology be there Conducted for assess the quantity of Inflammatory cells, the appearance of microscopy properties Fibroblasts, Granular tissue plus epithelial cells for every model.

Results

Figure (1): Test analysis histopathology (a) and (b) groupings exposed laser therapy advantage wounding corrective. Indicated a positive reactions began after the firstly post-operative day throughout the decrease from Inflammatory cells by induction Epithelial cells creation after together edges of the injury in comparable the grouping (c) and controller grouping.

On the third day, the consequences of injure remedial were seemed primary on the treated grouping (a, b) in comparly per the treated grouping (c), then controller grouping .The marks designated Inflammatory cells as well as Fibroblasts propagation creation by Fibrous connective soft tissue full in Collagen. Furthermore evident quantity of tissue Granulation be there observed since together edges from incision and Epithelization it was initiated, fig (2). Control Grouping exposed reduction apparition Restorative marks injure, wherever wounding edge full by attacked lifeblood coagulate thru great numeral of Fibroblasts , inflammatory cells permeation by creation a small amount quantity of Epithelial and Granulated tissue after together edges of wound

By the seventh Days after surgery grouping (a), (b) showed Granulated tissue created after Fibroblasts retractor has proliferated, the Receptacles bloody crowded. Within addition to emergence a full restoration of the wound with the restoration of the skin, then there comes about various therapeutic combinations between these groupings. This approved together with another papers. [15]

But it was seen as a Scar tissue in the form of a tinny cover the incision edge then severe hyperplasia in the epithelial cells that come to be larger usual in

the circumscribing soft tissue, was observed and Fibrous connective tissue, cellular in wounding line of controller grouping, *fig 3*.

But in a very deep wound, it showed the group that received treatment (c) at the 1 be there –3 -7-days after the operation of any reduction in the size of the wound, a very thick blood clot on both sides of the tip. The results showed not any marks of recovery, and a laser he ne failure applying this energy in this style of wounding therapy, fig (4).

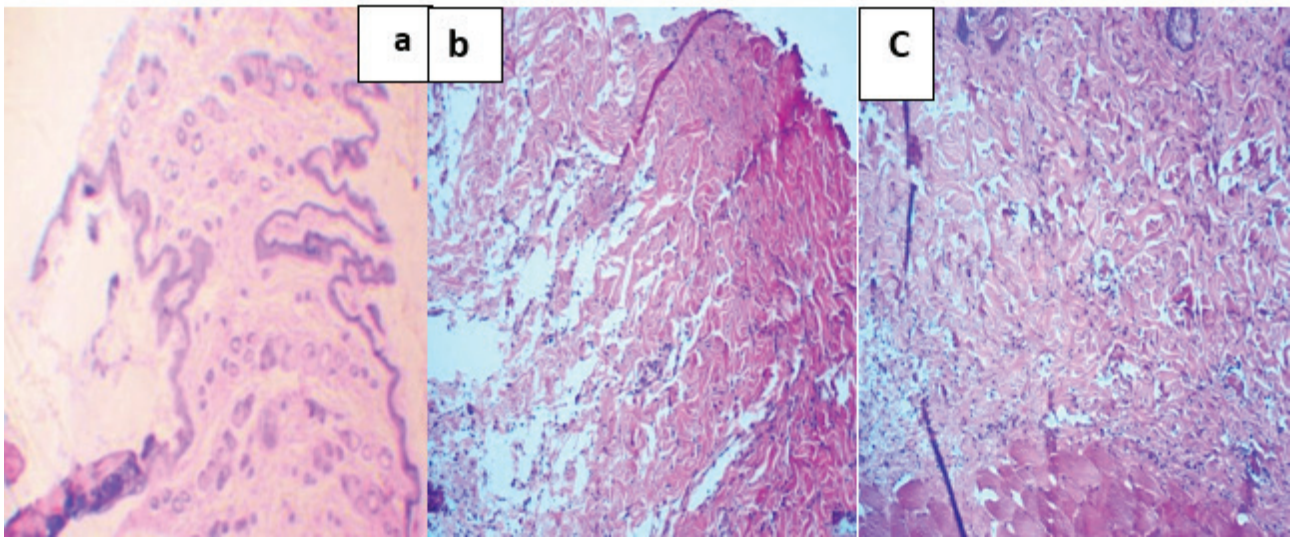

Figure 1. Firstly days after the operative, comprising grouping (a), (b) slice revealed the edge of wound be fulfilled by blood clot, and explained in Fibroblasts and the spread of blood clotting. Groupings (C) afterward days firstly the slice showed life blood coagulate on the managed location.

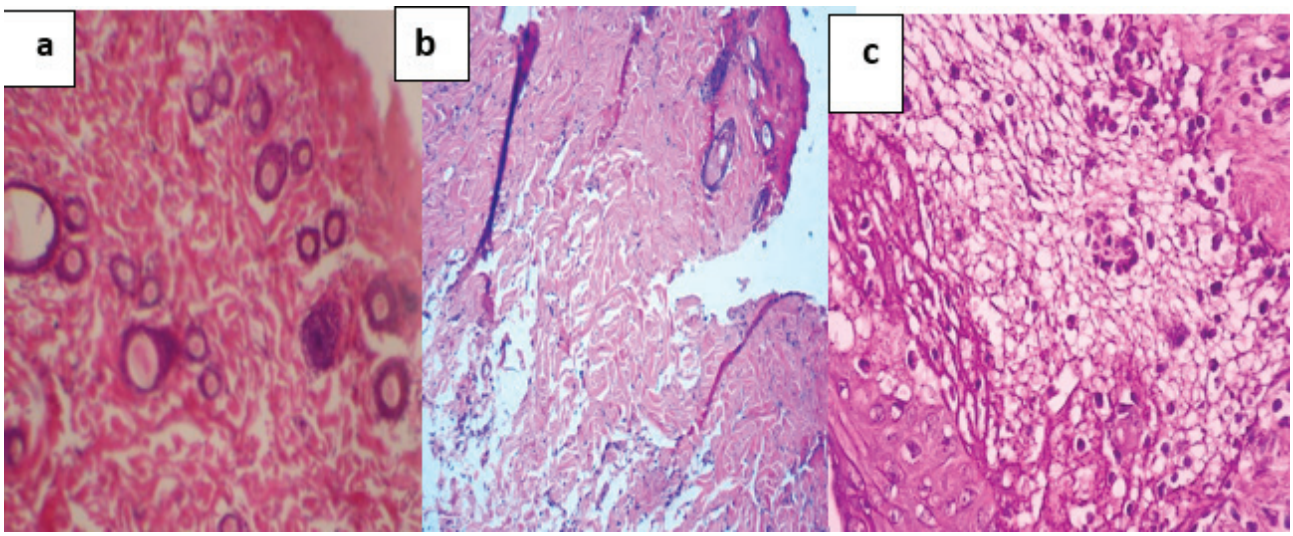

Figure2. **Grouping (a), (b) slice on the Third day after operation** ***Infiltration made a small number of small inflammatory cells numeral of fibroblasts proliferation and the creation of little fibrous connective tissues. Controller*** **grouping (C) which a blood clot started in the Emergence the beginning of epithelial cells proliferation of fibroblasts with inflammatory cells since together locate.**

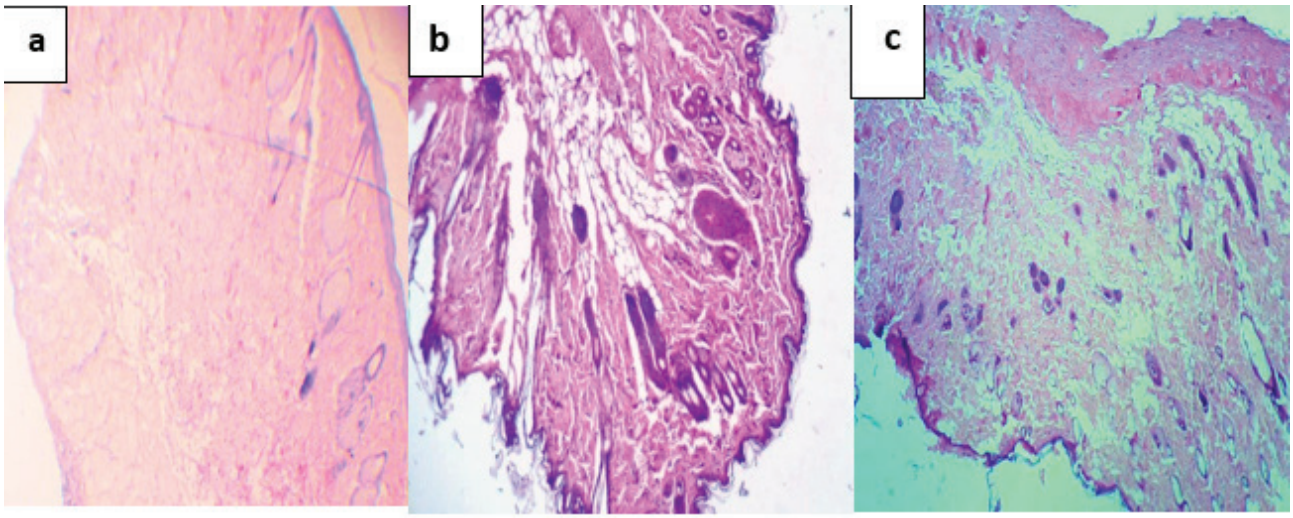

Figure 3 Grouping (a) thin layer (b) on the seventh day is the restoration of the completion of the skin including the formation of collagen small connective fibers of connective tissue and not at all inflammable groups in the detection of control showed assembly tissue scar, inflation observed in epithelial cells and connective tissue fibroblasts In the cell line.

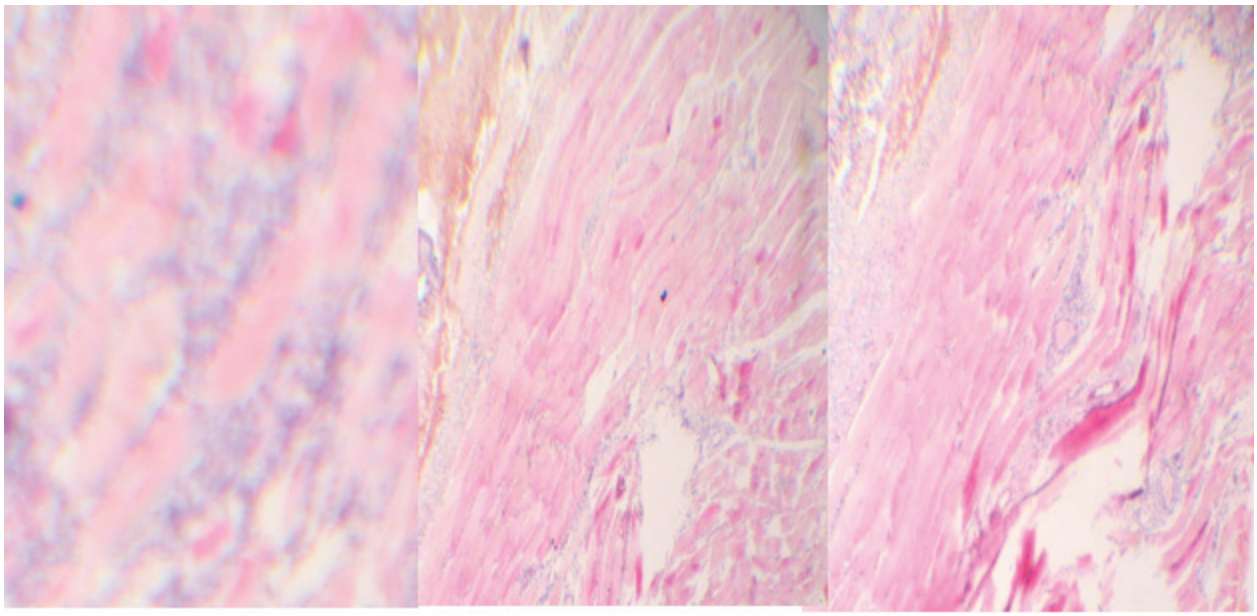

***Figure 4*: Grouping (c) reveal excessive blood clotting for in both locations the wound with a thick edge.**

Discussion

In the current paper, the possibility of laser helium neon in the treatment of different depths of wounds.

The development of the Collagen production and prevent inflammation resulted from examination of laser treated tissues.

That guided experience HelumNeion laser (632.8) Nano-meter display rapider stages proliferative inflammatory. Then there was healing great failures in the first stage on the first day of the group (c). That means lacking efficiency in the treatment of a very deep wound

(Dogan, SK. et al) and other revealed disadvantage in remedial with laser therapy[16-20]. In many animal pattern experiments, lasers have been accepted as a supplement to additional operation in curative treatment, as low-level lasers are used to accelerate wounding remedial(21).

By contrast Status information and medical experiences thru human being may have great results in action laser therapy in wounding restorative[22].

(Liao X, and Xie GH) who found that healing were completely healed, laser therapy seemed to accelerate the restoration stage of remedial, in which the intensity of the granulation tissue would be pretentious, [23, 24, 25]

(Ty Hopkins et al) Laser therapy is an active healing to promote partial reduction of wounds from corrosion. Additionally accelerates wounding reduction of non-exposed wounding off the same arm, showing an indirect influence happening the surrounding area tissue [26].

Numerous hypotheses can benefit clarify the reduction of injuries recover As well In vitro reports have presented an improve in the proliferation of fibroblasts after treatment

Conclusion

Laser detection and treatment using long wavelength Helium -neon 632.8 nanometer (1.6) J / cm2 Energy density exposed for 4 minutes to advance injury to therapeutic incentives in rat, and then Make any benefit results in a very deep wounding using wound related technology.

Conflict of Interest :Theris no

Source of Funding: Self Source

Ethical Clearance : Ethical approval of the al-qadisiyah university

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