



Effects of low level laser therapy on the cicatricial dehiscence in the postoperative period of lipoabdominoplasty. Case Report.

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ABSTRACT

Introduction: The surgical procedure is used for the treatment of external and internal injuries and diseases, performed through operations. In this context, the plastic surgery has the purpose of artificially reconstructing a part of the body. Among the various types of surgical interventions, lipoabdominoplasty is more accomplished, correcting the aesthetic and functional deformities of the abdomen, adding a better and more harmonious abdominal contour. **Objective:** To analyze the effect of the application of the low power laser in the repair of the cicatricial dehiscence in the postoperative period of lipoabdominoplasty in one patient. **Methodology:** A 25-year-old female patient who underwent lipoabdominoplasty surgery sought physical therapy in March 2017. She had cicatricial dehiscence, and started the pharmacological and physiotherapeutic treatment with low-power laser, AsGa, 12 s, 6J, non-contact. **Results:** It was observed improvement of the dehiscence progressively, with reduction of the local inflammation, reorganization of the tissue and closure of the wound, presenting in the end only the surgical scar. **Conclusion:** This study demonstrated positive effect of laser therapy, recovering the injured tissue, signaling a new non-invasive approach to a safe and beneficial treatment.

Keywords: Physiotherapy; Laser Therapy; Plastic Surgery; Complications.

INTRODUCTION

Since the nineteenth century, society's standards of beauty have suffered constant interference from the media. Women and men seek more and more interventions aimed at achieving the imposed standard, or to solve the body changes caused by the accumulation of localized fat, excess skin and abdominal diastasis, which negatively alter the aesthetic aspect of the abdomen^(1,2).

Faced with the dissatisfaction with the aesthetic aspect of the abdomen, emerges the search for rapid interventions without major physical efforts, among them, the surgical procedure⁽²⁾. This is a specialized method for the treatment of deformities, injuries and external or internal diseases, performed through operations⁽³⁾.

In this context, plastic surgery has the purpose of artificial reconstitution of a part of the body to recover and restore the shape altered by some disease, trauma or congenital defect or with the objective of embellishment the body shape⁽³⁾.

Among the various types of surgical interventions, abdominoplasty is most commonly performed, since in

addition to the removal of excess skin and fat, in most of the procedures some type of correction is performed on the abdominal muscles^(4,5).

With the contribution of Illouz⁽⁶⁾, describing liposuction in the 1980s and surgeries with selective detachment of the abdominal flap as recommended by Saldanha⁽⁷⁾, was formed the ideal combination with regard to a more complete surgery and with fewer complications, the abdominoplasty was no longer the only solution for the improvement of the abdominal silhouette, receiving the contribution of liposuction⁽⁸⁾.

Using a selective detachment between the inner edges of the rectus abdominis muscles, lipoabdominoplasty corrects the aesthetic and functional deformities of the abdomen, adding a better and more harmonious abdominal contour. The technique is based on the preservation of the abdominal perforating vessels, branches of the deep superior and inferior epigastric artery^(9,10). The nervous and lymphatic systems are also preserved. This technique is indicated for cases of abdomen with flaccid skin, accumulation of fat and diastasis of

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the rectus abdominis muscle. Lipoabdominoplasty represents a formal indication for smokers, post-bariatric and overweight patients⁽⁷⁾.

Variations of techniques help to reduce the incidence of postoperative sequelae, also associated with adequate treatment and guidelines after the surgical procedure. However, there are still postoperative complications that are divided into major and minor ones. The major ones are those that need hospitalization for treatment and the minor ones are those that can be followed in the outpatient clinic^(5,11,12).

Among the complications is dehiscence. The dehiscence of the operative wound is the separation of deep planes, followed by fluid discharge and subsequent formation of incisional hernia. Its incidence is varied and this can occur due to infection or over tension of the flap, ischemia and interference in healing. Although a large part of the plastic surgery dehiscences are small in size and do not require an acute phase resection, it remain a serious complication due to the risk of infection and the psychological disorder caused to the patient in relation to the final result of the surgery⁽¹³⁾.

Physiotherapy has resources that help to reduce and treat complications. Among the resources used, we can mention the Low-power Laser (Light Amplification by Stimulated Emission Of Radiation), which when applied directly to tissues, modulates some biological processes. It is able to accelerate cell division. There is an increase in leukocytes that participate in phagocytosis and a greater synthesis of collagen by the fibroblasts, stimulating the local circulation and accelerating the cicatricial process in an organized and controlled way^(14,15).

Therefore, the objective of the present study was to analyze the effect of the low-power laser application on the recovery of the cicatricial dehiscence in the postoperative period of lipoabdominoplasty.

METODOLOGY

Female patient, 25 years old, performed lipoabdominoplasty surgery on February 16, 2017. The patient, who presented cicatricial dehiscence, sought physiotherapy in March 13, 2017 and reported that she was performing the drainage procedure with another professional when inflammation occurred. The patient protected the entire scar with a micropore for a week, which caused the worsening of inflammation and the appearance of the complication, due to a misunderstanding of the medical orientation. Then began the pharmacological and physiotherapy treatment with low-power laser.

Consent

This study was approved by the research ethics committee of the Universidade Federal do Rio Grande do Norte, with protocol number 080112/2017. Informed written consent was obtained from the patient for publication of this case report and all accompanying images.

Physiotherapeutic treatment:

The treatment began on March 13, 2017. The lesion presented 7 cm of length and 2 cm of width. The Laser used was the AsGa, during 12 seconds, 6 J of power, punctual without contact. The Laser was applied daily and was performed daily photographic record. During treatment on April 2, 2017, she reported intense itching. The treatment was terminated on April 22, 2017, totaling 40 days.

Pharmacological treatment:

The pharmacological treatment started with the use of dipropenta and sunflower oil, and cephalexin 500mg. With four days of physiotherapy, started the treatment with DERMACERIUM[®] ointment (silver sulfadiazine). At the end of the intervention with the laser, she continued to pass the ALISTIN[®] ointment (carcinin) on the scar.

RESULTS

The results are presented in Figure 1. The improvement of the dehiscence is observed progressively, with reduction of the local inflammation, reorganization of the tissue and closure of the wound, presenting only the surgical scar in the end of the treatment.

DISCUSSION

These results demonstrate that the low power Laser obtained positive effects on the cicatricial dehiscence, causing the recovery of the tissue. This corroborates with Santos and Mejia⁽¹⁶⁾ who believe that laser irradiation contributes to the healing process of the skin resulting in a better local blood circulation and accelerating the cicatricial process.

According Karu and Pinto^(17,18), this happens because the low energy intensity generates the process of biomodulation, which is the stimulation of the cell membrane and mitochondria, by the cellular energy increment, causing a synthesis of collagen by the fibroblast, recovering the energy function of the cell and the tissue repair.

Even without histological analysis to confirm biomodulation and increase of collagen, studies show that the use of red light allows the absorption of incident photons, providing necessary energy of the cicatricial process of the tissue. Rocha Jr et. al. and Araújo et. al.,^(19,20) indicated that phototherapy promotes increased cell and collagen proliferation and accelerated the process of wound epithelialization.

The result of this study is probably directly related to the deposited energy level, as some authors believe that there is a therapeutic window for effective photostimulation above a threshold value, but below a value, that causes a photoinhibition. This concept is described as the Arnoldt-Schultz law, which predicts the existence of a dose-dependent effect represented by a fluence response curve versus biological response curve^(21,22). The recommended fluence to promote tissue repair is between 1 and 5 j/cm² and above doses would



Figure 1: Evolution of the healing process A: 1 day; B: 3 days; C: 7 days; D: 9 days; E: 9 days; F: 9 days; G: 12 days; H: 12 days; I: 14 days; J: 22 days; K: 22 days; L: 22 days; M: 29 days; N: 40 days.

provoke inhibitory or unsatisfactory effects⁽²¹⁾. Even if the Laser dose used in our study is not in j/cm^2 , the amount of energy offered is within this range in Joules.

Probably the drugs used during the laser treatment process may have contributed to the results. Linoleic acid is a proinflammatory mediator, which causes a considerable increase in leukocyte and macrophages migration, in addition to having an antibacterial effect, which is present in sunflower oil⁽²³⁾. Cephalaxin, however, disrupts the growth of the

bacterial cell wall, and dermacerium[®] (silver sulfadiazine) and diprogenta help in the process by decreasing the action of bacteria⁽²⁴⁾. Thus, the use of these components may have aided in decreasing dehiscence.

CONCLUSION

There are few studies about the conservative treatment in the cicatricial dehiscence after lipoabdominoplasty with therapeutic laser. With this, there remain some suggestions for



future studies on the amount of energy to know if there would be different results, different frequencies of treatment and different extensions of dehiscence. In this study, the positive effect on the recovery of the dehiscence was demonstrated, with reduction of the local inflammation, tissue reorganization and wound closure, recovering the injured tissue and signaling a non-invasive possibility of safe and beneficial treatment.

AUTHOR'S CONTRIBUTION

VSR- Data collection and review of work; RMVS- Article review and writing; MKFS- Data collection and article writing; JDCS- Data collection and article writing; EMC- Review and guidance of the work; PFM- Review and guidance of the work.

CONFLICT DE INTEREST

The authors declare that there was no conflict of interest.

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