Case Report

Journal Of Clinical & Medical Images Case Reports

Open Access, Volume - 2

Laser therapy and application of Aloe vera for wound treatment after mastopexy complications: A case report

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Received Date : Apr 29, 2022
Accepted Date : June 15, 2022
Published Date : Jun 29, 2022
Archived : www.jcmimagescasereports.org

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Abstract

Mammoplasty is a surgery aimed at reducing breasts, being an invasive procedure and with the possibility of post-surgical complications. In the case presented, the patient had healing difficulties which progressed to an intense inflammatory process that evolved to necrosis of the areolas, laser therapy sessions were applied using lasers with red LED and blue LED in order to treat the inflammatory process, stimulate regeneration of tissue and collagen synthesis, treat the patient's pain, hydrate the tissues, fight infections and skin diseases and whiten the area. It was associated with the application of Aloe vera in natura to treat wounds and heal the local. It was observed that after treatment there was a significant improvement in areola necrosis, healing of the injured part and improvement in collagen production. Making an evaluation during the 24 sessions, we were able to assess that in synergy between the Red Laser, Infrared, Blue LED and the use of the active ingredient Aloe vera corroborate the evolution of tissue healing.

Keywords: Aloe vera; laser therapy; mastopexy; surgical complications.

Introduction

Mastopexy or reduction mammoplasty is a surgery performed to reduce the breasts are usually more invasive because it involves larger incisions, tissue, skin, fat and repositioning of the areolas. These patients have back and neck pain due to the weight of the breasts, in some cases, the clinical picture even presents curvature of the back, some patients seek this type of surgery because they are unhappy with their aesthetic appearance [1]. Necrosis occurs when cells in a particular region of the body fail to receive enough oxygen. There are risks that are managed by the patient and risks inherent to the surgery technique itself. There are more common factors after surgery, which are headaches and in the surgery itself, bleeding at the site, keloids, infection, necrosis and thrombosis. It is not common to happen necrosis in the breast after mammoplasty, the probability is around 1%, factors that interfere with healing are smoking and diabetes [2, 3]. In performing this type of surgery, it is necessary to raise the areola, due to a structure called the Areolocapillary Complex - CAP, it can suffer some injury, when this tissue does not receive oxygen causing necrosis [3, 4].

The doctor responsible for the surgery cannot observe if there is any type of injury in the NAC, this usually occurs in breasts with ptosis because the greater the distance that the areola will travel during the surgery, the greater the chances of any injury to the NAC. Several authors sought to describe studies that showed assessments regarding complications in breast reduction surgery. The most common complications found in the literature were described, related to blood perfusion of the nipple-areola complex (NAC), operative site infection, dehiscence, asymmetries and changes in sensitivity secondary to the surgical procedure. The type of injury that occurred was scarring below the right areola in the stitches and tissue necrosis in the left areola, the probable cause may have been because of the NAC injury. Each author in the literature as well as those present on the table describes the safety of each flap, with its particularities, but without comparing the different techniques with each other1. The treatment performed was Red, Infrared, Blue Led laser therapy and the Aloe and vera plant [4].

The laser performs an amplification of light by stimulated emission of electromagnetic radiation that emits coherent and collimated light that can have different powers, for therapeutic use, we use low power laser that increase lymphocytes

Citation: Emerson Barbosa da Silva. Laser therapy and application of Aloe vera for wound treatment after mastopexy complications: A case report. J Clin Med Img Case Rep. 2022; 2(3): 1181.

and phagocytosis, increasing fibroblasts and intensifying reabsorption of fibrin and due to the characteristics Biostimulators accelerating tissue repair, due to mitotic activation of epithelial cells, produces collagen and decreases the synthesis of inflammatory meters.

Treatment Red and infrared laser therapy (light amplification by stimulated emission of radiation) Red Light (660nm): Red light treats inflammatory processes, stimulates tissue regeneration and collagen synthesis, improves vascularization and angiogenesis, increases ATP production. It acts on the epidermis, dermis, hypodermis, muscle fascia, muscle tissue, tendinous ligament [5]. Infrared Light (808nm): Infrared light has the analgesic function (pain treatment) as the main point, acts in lymphatic drainage and edema, has an anti-inflammatory effect and increases the absorption of products by 40 %. It acts on the epidermis, dermis, hypodermis, muscle fascia, muscle, ligament, tendon, nervous and bone tissue [6]. Blue Light (470nm): Blue light has bactericidal and fungicidal action, promotes tissue hydration, fights infections and skin diseases and has a whitening effect. It acts mainly on the epidermis and on open lesions in the dermis [5, 6]. The healing caused by the blue LED is a mechanism of molecular events divided into three phases: inflammatory, proliferative and remodeling. It is in the remodeling phase that the recovery of tissue structure occurs through maturation of elements and changes in the extracellular matrix, where the deposit of proteoglycans and collagen occurs.

Case Presentation

Patient 27 years old, female, denies smoking and alcohol consumption, denies diabetes mellitus, underwent mastopexy surgery to reduce and improve the sagging of the breasts, after performing the surgery below the right areola, she presented difficulty in healing in the stitches and in the left areola necrosis and difficulty healing the stitches. Patient underwent breast reduction surgery, after surgery the breasts present exudate thickening of the skin in the right areola in the stitches it began to show difficulty in healing, in the left areola that was not healing, there was a darkening of the areola and after two weeks the tissue it was already completely necrotic. The plastic surgeon who performed the surgery indicated the use of Kollagenase (collagenase) Cristália®, intended for the treatment of skin lesions when debridement is indicated in wounds, ulcers and necrotic lesions. Without evolution, the professional indicated Lasertherapy to the patient. The methodologies applied during the first 20 sessions were performed 3 sessions per week, red and infrared laser therapy doses of 8 J/cm2 and blue LED using the Laser Therapy EC - DMC® equipment. 24 laser therapy sessions were carried out, in all of them both blue and red led were used. The first 20 sessions were held 3 times a week, after which 4 sessions were held, one per week. The patient applied Aloe vera in natura 3 times a day on the lesion, before application, asepsis of the lesion was recommended.

The patient underwent anchor mastopexy with the desire to improve the aesthetic aspect of the breast, in addition to improving physical aspects such as pain in the spine, after a week of the surgical procedure the patient noticed that the left breast took longer to heal when compared to on the right. The lesion turned red and began to produce fluid, the shape of the areola was changing due to the intense inflammatory process. After a few days, a blackened stain began to appear, which characterized a necrosis process that soon extended, the incision became swollen and without the possibility of healing as seen in (**Figure 1**).

Figure 1: *Left breast with extensive necrotic ulceration in the areola.*

In the first consultation, skin debridement was performed, which aims to remove the largest amount of dead tissue, in order to reduce the process of tissue necrosis and reduce the possibility of infection by opportunistic pathogens, which would complicate the situation. The lesion was now cleaner (**Figure 2**) and it was possible to carry out an effective treatment plan.

The application of Infrared and Blue LED was started, three times a week until completing the twenty sessions, during the treatment the patient performed the topical application of Aloe vera in natura to assist in the healing process in the skin and enhance the treatment. The lesions became redder, since the treatment increases tissue perfusion, improving nutrient delivery and access to defense cells that help in the healing process (**Figure 3**).

After the tenth session, the tissue improvement in relation to necrosis was already noticed and until the twentieth session, areas of necrosis in the breast were no longer seen, which showed the efficiency of the treatment (**Figure 4**).

Figure 2: *Left breast after debridement and cleaning of the lesion.*

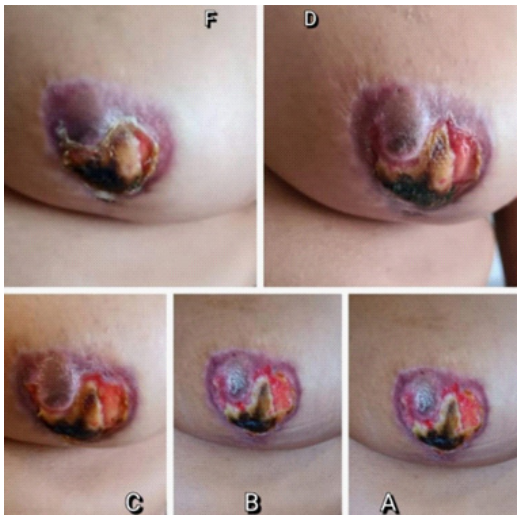

Figure 3: *A-F: Evolution of the lesion between the first 5 sessions.*

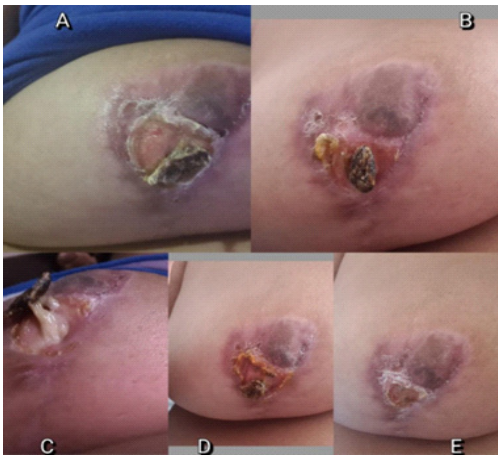

Figure 4: *A-E: Aspect of the lesion from the tenth and twentieth sessions.*

Figure 5: *A-B: Result of the twenty-fourth session.*

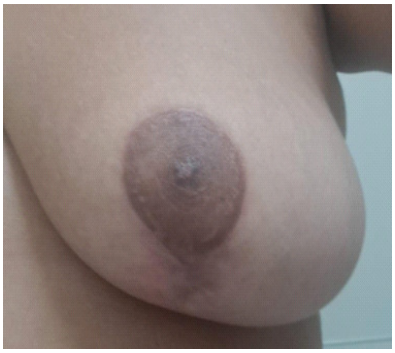

Figure 6: *Aspect in the breast at the end of treatment.*

After the twenty-fourth session, the tissue has already been fully recovered and fibrosis at the site where the lesion was, showing the tissue completely healed, without bleeding and without production of fluids from the inflammatory process as seen in (**Figures 5** and **6**), leaving the optimistic patient and with improved self-esteem and non-psychological trauma suffered after the surgical complication.

Aloe vera, popularly known as aloe, is a medicinal plant that brings benefits to skin health. The hydrating action of the plant has already been proven in several studies. However, there is still not enough scientific evidence to confirm its healing effect [7]. Pyrocatechol, cinnamic acid, ascorbic acid and p-coumaric acid are some of the substances involved in the bactericidal (destroying bacteria) and bacteriostatic (preventing the proliferation of bacteria) effect of Aloe vera. The plant has antimicrobial action and fights some types of fungi, viruses and bacteria [7, 8, 9].

The use of Aloe vera can aid in healing and re-epithelization (repair of skin tissue) in a short period, if properly indicated, in case of burns [10]. Infrared density therapy has an anti-inflammatory effect, through vasodilation, it also has a beneficial effect on nerve cells, decreasing sensitivity and blocking the pain transmitted by these cells to the brain [9]. The laser penetrates deep into tissue and accelerates cell reproduction and growth. In this way, it increases the energy available to the cell so that it can absorb nutrients more quickly and get rid of waste products. As a result of laser exposure, damaged cells are repaired more quickly [10, 11].

Blue light laser therapy stimulates the development of fibroblasts in the damaged tissue. Fibroblasts are the building blocks of collagen, which is the essential protein needed to replace old tissue to repair tissue damage. Thus, the technique is effective in improving the aesthetic appearance of surgical scars and in the treatment of open wounds and burns, reducing the formation of fibrous tissue and keloids [12]. Thus, we noticed that the therapy associated with laser brings several benefits, mainly by accelerating the healing process of the skin, leading to the best appearance of the tissue and reducing the lesion, being in this situation the best treatment available for the conditions and access to the technologies that the patient can enjoy [13].

Conclusion

Although mammoplasty is a surgery aimed at improving not only the quality of life of the patient, also helps in self-esteem. Is important stress the necessary care during these procedures so that no negative side effect occurs, as in the case presented? When the patient goes through this situation, she has a worsening in her health and self-esteem, because there may be cases where recovery is not possible, affecting that person's life permanently. Fortunately, with the technologies we currently have, it is possible to perform treatments for help with the problem. It was observed that the synergistic treatments that were performed corroborate the improvement in the recovery of breast tissue.

Acknowledgments

The Sara Magna Clinic – Dermatologist and Naturopath, the Coordination of the Biomedicine and Pharmacy Course at the

Centro Universitário Ítalo Brasileiro and the Centro Universitário FMABC.

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