

## PERFORMANCE OF THE DERMATOFUNCTIONAL PHYSIOTHERAPIST IN COMPLICATIONS ARISING FROM THE POST-OPERATIVE LIPOSUCTION AND ABDOMINOPLASTY

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**Abstract:** Introduction: In short, abdominoplasty consists of removing excess subcutaneous and adipose tissue from the abdominal region, whereas liposuction removes excess adipose tissue, however, a post-surgical period without adequate follow-up generates a high risk of complications, therefore, it is necessary to a specialized and individualized treatment protocol based on the resources available in the dermatofunctional area, among which manual therapy and electrotherapeutic resources can be highlighted as minimizing and/or repairing possible damage. Objective: To review the importance and performance of the dermatofunctional physiotherapist in complications resulting from the postoperative period of plastic surgeries of abdominoplasty and liposuction. Methodology: This is an integrative literature review through the search for scientific data on the following platforms: PubMed, Scielo, Google academic and in the journal of the Brazilian Journal of Plastic Surgery, being published between the years 2011 to 2022. Results and discussions: Sixteen articles were selected that aim to use resources and techniques available in dermatofunctional in the treatment of complications resulting from the postoperative period of liposuction and abdominoplasty. Final Considerations: It can be seen that the physiotherapeutic resources and techniques are effective for the reduction and/or recovery of complications arising from plastic surgeries of abdominoplasty and liposuction, with the predominant treatment being manual lymphatic drainage and lymphotaping, however, they are necessary new studies on the resources resulting from these complications.

**Keywords:** Dermatofunctional Physiotherapy; Complications; Post-Surgical; Liposuction; tummy tuck.

## INTRODUCTION

Currently, through the media, society has standardized an image of the ideal body, being focused only on the physical appearance in which the figure of youthful beauty dictates the aesthetic and behavioral model, leading the individual to search for perfection, changing his autonomous body and its characteristics partners (COUTINHO; TOMAZETI; ACOSTA, 2013).

Therefore, plastic surgery is seen as a second way in an attempt to achieve the ideal body and increase self-esteem (CARVALHO, 2020). It is defined as a procedure capable of favoring, repairing and rebuilding body shape and contour (PEGORARE, 2021). Therefore, in order to achieve the objective, the desire for services is enhanced (YAMASAK et al., 2013). Since surgical procedures cause a quick and instantaneous alteration of the body and it approaches the desired one, in addition to providing new repairs over time (CARVALHO, 2020).

As a result of these new social changes, the International Society of Plastic Surgery (ISAPS) carried out a study aimed at the growth of aesthetic surgical procedures in 2019, in which the result obtained reported an increase of 1.5 million in the performance of these procedures. Among all the surgeries presented, abdominoplasty led the ranking and liposuction has been gaining prominence in the table (ISAPS, 2019).

High-definition laser-assisted liposuction has been gaining prominence in the market among all other surgical procedures, due to the removal of an extensive portion of subcutaneous adipose tissue through small cannulas inserted into the skin, in which adipocytes break down, transforming -o in a liquid portion so that suction is carried out, this procedure promotes the reduction of tissue trauma which favors the reduction of fibrosis formation, pain and faster recovery.

In addition to traditional liposuction, which consists of aspiration of the deepest layer of adipose tissue, leaving a small portion of adipose cells in the most superficial region of the abdomen, there are also ultrasonic and vibratory lipoplasty (MOTA, 2018).

Abdominoplasty, on the other hand, aims to remodel the body curvature and the abdominal region, removing the skin and excess adipose tissue, through a deep cut in the tissues (CARVALHO, 2020). The literature has several surgical techniques for performing abdominoplasty, including: classic abdominoplasty, miniabdominoplasty, navel repositioning, remaining vertical scar, transverse Pitanguy dermolipectomy and the over-pants technique (VILLEGAS et al., 2022).

Despite technological advances in surgical aesthetic procedures, the possibility of complications has not been ruled out, they may occur due to the procedure itself, prior previous and postoperative risks (CARVALHO, 2020). Among them are: wound dehiscence, hypertrophic scarring, tissue fibrosis, hematoma, adherence, edema, pain, ecchymosis and seroma (TACANI et al., 2013).

Thus, due to the high demand and performance of procedures, it is essential that the dermatofunctional physiotherapist be prepared and able to provide effective therapy for the patient. For this, it is essential to obtain knowledge to reduce the possible risks of a complication, to achieve a successful surgery (BEZERRA; FERREIRA, 2020). Therefore, the resources and techniques that most help the physiotherapist in the postoperative period are: electrotherapy, manual therapies and thermal agents (MACEDO; OLIVEIRA, 2017).

Therefore, the present study aims to present the resources, maneuvers and possible conducts of dermatofunctional

physiotherapy in complications resulting from the postoperative period of liposuction and abdominoplasty, in addition to demonstrating the performance of the dermatofunctional physiotherapist in complications resulting from the postoperative period of liposuction surgeries. and abdominoplasty.

## METHODOLOGY

This study is an integrative literature review, developed from the following guiding question: “What are the resources and conducts used by the dermatofunctional physiotherapist in complications in the postoperative period of liposuction and abdominoplasty?”.

A search for studies was carried out in the following databases: *Scientific Electronic Library Online* (SCIELO), PubMed and Google Scholar. To expand the results, a direct data survey was carried out in the journal of the Brazilian Journal of Plastic Surgery, using descriptors in Portuguese and English: dermatofunctional, physiotherapeutic resources, complications, abdominoplasty, liposuction, these terms were combined using the Boolean operator *AND*.

In the first instance, for the analysis of the articles, the selection criteria were: case trials, pilot, experimental, descriptive of the type of data collection and observational cross-sectional study, in addition to case reports that addressed the physiotherapeutic treatment in complications resulting from the postoperative period of liposuction and abdominoplasty, published in journals in Portuguese and English between 2011 and 2022.

Articles that were not available for reference and/or publication, in full, theses, monographs, abstracts and those that were not related to the proposed theme were excluded.

To complete the selection of articles, a brief reading of the abstracts and titles found

was carried out, establishing a relationship with the proposed objective, by the guiding question together with the inclusion and exclusion criteria, then there was a complete reading of the chosen articles, being carried out an analysis of 14 titles. Finally, there was data collection and interpretation of the results found, being organized in a file and listed for discussion.

Of the articles found, relevant data for discussion were recorded, namely: author and year, title of the work, results found and techniques used, for a better presentation of the results, a table was constructed, which presents all the steps taken.

## RESULTS

For a better visualization of the results found, a diagram was created with the details of these data.

When applying the descriptors together with the Boolean AND operator in the *Scientific Electronic Library Online* (SCIELO) database, 12 articles were found, 4 of which were selected for the study, of which 2 were published in Portuguese and 2 in English, being excluded 9 articles because they did not fit the search inclusion criteria.

In the PubMed database, using the Boolean AND operator, a total of 6 articles were found, with only 3 being used, in which 2 were published in English and 1 in Portuguese, 3 articles being excluded in total, as it was not possible to find them. them in full.

In Google Scholar, when applying the descriptors separately and together, the search presented more significant results, with a total of 335 articles being found, only 5 being selected for the study, all of which were published in Portuguese, with a total of 328 articles being excluded for not being meet the inclusion criteria.

To expand the results, a direct search was carried out in the journal of the Brazilian

Journal of Plastic Surgery, and 2 articles were found, all of which were selected and both in English.

Therefore, the search for the data was structured as follows: search and analysis in the database, 355 articles were found, after a brief reading, 339 were excluded, leaving only 14 articles. The articles selected for the study were structured and listed in Table 01 below.

## DISCUSSION

According to the collection of data chosen for the analysis of this study between the years 2011 to 2022, there was a predominance of females in the approach to cases in which they underwent the aesthetic surgical procedure of liposuction and abdominoplasty, aged between 18 and 67 years, however, the articles selected and the search for the data until now, there has been a minimal participation of the male population in these surgical aesthetic procedures, despite the current contexts, accounting for only 14 participants.

Regarding the physical therapy resources and techniques used in the treatment of complications resulting from the postoperative period of liposuction and abdominoplasty, the following techniques were found in the literature: manual lymphatic drainage, massage therapy, *lymphotaping*, low-power laser, ultrasound, microcurrent, myofascial release, therapy by extracorporeal shock waves and radiofrequency. Among the aforementioned techniques, all presented positive results in the recovery of patients, however, there was a predominance of some resources used in the effective search of data, such as manual lymphatic drainage and *lymphotaping*. In terms of complications, the one that stood out the most was fibrosis.

The performance of the dermatofunctional physiotherapist is not only related to their assistance in the postoperative period (SANTOS et al., 2020), but also in the

preoperative period, in which the patient is prepared for the surgery, in which possible complications are evaluated. motor and physical changes, in addition to minimizing possible thoracic complications (MASSOM et al., 2014) and intraoperatively to carry out a detailed planning of the surgical process, but there is no detailed context about its actions and indications in this phase, further studies are needed in this area (SANTOS et al., 2020).

In this context, recent scientific publications reaffirm the importance and effectiveness of dermatofunctional physiotherapy in preventing possible complications in the postoperative period of plastic surgeries and aesthetic corrections (MEYER et al., 2011), in order to prepare the tissues that will be submitted to the surgical aesthetic procedure, optimize its function, in addition to promoting the well-being and improving the quality of life of these patients, promoting an appropriate and rapid recovery (MASSOM et al., 2014).

As a result, there was a greater participation of the population and the medical community with the aim of prescribing and indicating the beginning of an early treatment for their patients, to minimize the possible risks of complications. Furthermore, the number of physiotherapeutic appointments is associated with the patient's clinical condition, so the better the patient's condition, the smaller the number of techniques used (MEYER et al., 2011).

In view of this, a new concept has emerged about care after plastic surgery, in which to achieve a satisfactory result it will not depend only on the plastic surgeon but on a team, to assist in pre, intra and post-operative care. operation, so that the final result is satisfactory (SANTOS et al., 2020).

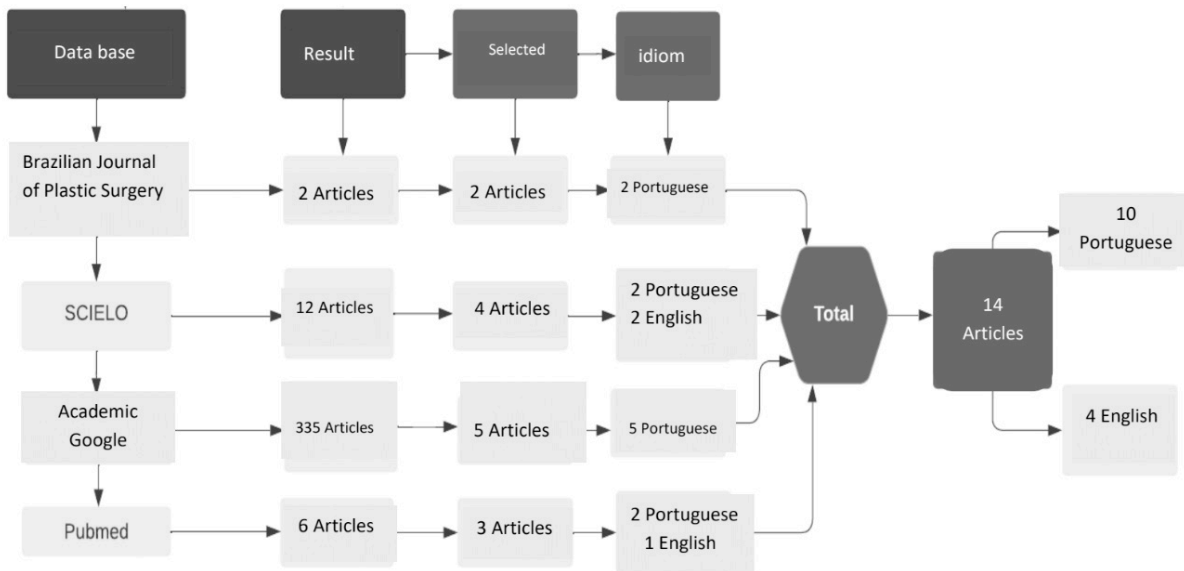
Furthermore, Meyer et al. (2011) also point out that in order to obtain an effective treatment, it is necessary for the physiotherapist

to have mastery over the tissue repair phases, since most cases of complications occur in these phases, in addition to a critical and observational character to identify the clinical characteristics of the patient, so that, in each case, an individualized protocol can be reconstructed.

Furthermore, Silva et al. (2012) also emphasize the importance of maintaining an adequate protocol within these tissue repair phases, in which there are numerous possibilities of treatments for the prevention of possible complications in the postoperative period, each one suitable for the respective surgery chosen. Among them, the one that stood out the most was manual lymphatic drainage, which can be used in all stages of treatment remodeling. Furthermore, in the study by Meyer et al. (2011) the results found on the use of manual lymphatic drainage in the postoperative period of liposuction, demonstrated positive results in the reduction of edema, pain and medication intake.

As in the experimental study with a quantitative and qualitative approach by Chi et al. (2016) in which 10 women participated, on the association of manual lymphatic drainage with *lymphotaping*. The techniques were performed in patients who were in the proliferative phase and in the remodeling phase, in both of which they showed positive results in the treatment of tissue fibrosis resulting from abdominoplasty and liposuction surgeries, in addition to showing an improvement in metabolism.

Furthermore, in the study by Chi, Marquetti and Dias (2021) in a controlled clinical trial with 20 women, transoperative lymphatic *taping* was used as a treatment protocol for ecchymosis, as a result of which a reduction in the formation of ecchymosis was found, preventing the formation of edema and the occurrence of clinical conditions, in addition, this effect is linked to its action on



**Diagram 01**– Details of the results found.

Year/ Author	Title of Job	Techniques Used	Results Found
2011, Meyer, P.F. et al.	Physiotherapeutic protocol for the postoperative period of liposuction.	Manual lymphatic drainage techniques, ultrasound, radiofrequency, endermotherapy and others are used.	The results showed that most of the collected samples started the physiotherapeutic postoperative period in the early phase, performing more than 15 sessions and remaining for another 60 days in treatment, the most used resources being manual lymphatic drainage, 3MHz ultrasound, endermotherapy and radiofrequency.
2011, Pirola, F. M; Battiston, C.Z; Giusti, H.H.K.D.	The effect of radiofrequency on post-abdominal liposuction fibrosis.	As a resource, radiofrequency with electrodes of 70% intensity and temperature from 38° to 40°C was used, with a duration of 30 minutes divided by 5 minutes in each fibrotic point, and the use of the compressive belt after the end of the use of the resource.	According to the results found during the physical examination, it was possible to identify 6 fibrotic points in the liposuction site. Being divided into 2 groups, A and B, due to the distances between the fibrotic points, however, after the analysis and study of the treatment, the points became unique. After the use of radiofrequency, it was possible to identify from the statistical analysis a reduction of 50%, in relation to the highlighted areas, there was a more evident decrease, with the exception of fibrosis number 4, which maintained values close to those found in the physical examination.

<p>2011, Piveta, H.M.F. et al.</p>	<p>Clinical and digital photographic subtraction evaluation of the effects of ultrasound and massage therapy on late postoperative tissue fibrosis after liposuction.</p>	<p>Ultrasound and massage therapy are used in fibrous areas. The parameters used for the ultrasound were the continuous mode with an intensity of 1.5 W/cm<sup>2</sup> and a frequency of 3 MHz. The time calculated from the size of the area to be treated. In massage therapy, superficial and deep sliding maneuvers, kneading and friction were performed with greater speed and rhythm for 30 minutes.</p>	<p>For better organization of research findings, patients were classified as (A) and (B). Patient A showed a reduction in measurements between the pre- and post-test of 1.6% in the infra-umbilical perimetry, 0.6% in the region of the umbilicus, 2.42% and 1.86% supra-umbilical (5 cm and 10 cm, respectively). Patient B showed a difference between the pre and post-tests of 4.09% in the infraumbilical region, 3.3% in the umbilicus region, 3.5% and 1.4% in the supraumbilical region (5 cm and 10 cm, respectively).</p>
<p>2012, Silva, R. M.V. et al.</p>		<p>The resources cited were: manual lymphatic drainage, ultrasound (3 MHz), endermotherapy, radiofrequency, respiratory kinesiotherapy and TENS for analgesia.</p>	<p>The majority of the sample consisted of women who started the physiotherapeutic postoperative period in the early phase. From 15 to 30 sessions were performed, starting treatment between the 5th and 8th postoperative day, with manual lymphatic drainage and ultrasound being the most used resources. Other resources such as endermology, radiofrequency, respiratory kinesiotherapy and TENS were also mentioned, but it was not possible to describe in detail the benefits of the resources due to the lack of daily description of the medical records.</p>
<p>2014, Masson, I.F.B. et al.</p>	<p>Manual lymphatic drainage and therapeutic ultrasound in liposuction and lipoabdominoplasty post-operative period.</p>	<p>The resources used were: therapeutic ultrasound and manual lymphatic drainage.</p>	<p>The women were divided into 2 groups: 10 for the liposuction group (GL) and 8 for the lipoabdominoplasty group (LAG). All patients in the GL and LAG study had a significant reduction in pain, swelling and tissue fibrosis.</p>
<p>2016, Chi, A.M. S. et al.</p>	<p>The use of <i>lymphotaping</i>, combined therapy and manual lymphatic drainage on fibrosis in the postoperative period of abdominal plastic surgery.</p>	<p>The techniques used were: manual lymphatic drainage and <i>lympholaping</i>.</p>	<p>From the initial and final evaluation of the women, it was possible to conclude that the treatment is effective when sought from the beginning. The 10th patient sought treatment after 2 years of surgery, showing a lower result at the time of palpation of the fibrous tissue compared to the others.</p>
<p>2017, Roque, V.S. et al.</p>	<p>Effects of low-level laser therapy on the cicatricial dehiscence in the postoperative period of lipoabdominoplasty. Case Report.</p>	<p>The resource used was the low power laser, being applied daily, using AsGa, for 12 s, with 6 J of power, punctual without contact.</p>	<p>The treatment was divided into 2 parts, with pharmacological aid (diprogent and sunflower oil and cephalixin 500mg) and physiotherapeutic with low power laser (AsGa, 12 s, 6J, punctual without contact). The lesion was 7 cm long and 2 cm wide. Severe itching has been reported during treatment. After four days of physiotherapy, treatment with DERMACERIUM ointment (silver sulfadiazine). At the end After the laser intervention, she continued to apply ALISTIN ointment (carcinin) to the scar. Showing an improvement in the reduction of local inflammation, tissue reorganization and wound closure.</p>

2018, Chi, A. <i>et al.</i>	Prevention and treatment of ecchymosis, edema, and fibrosis in the pre-, trans-, and postoperative periods of plastic surgery.	The procedures performed were: manual lymphatic drainage with the Leduc method on the lower and upper limbs, abdomen and flanks, microcurrent (250 Hz; 150 µA) for 20 minutes on the abdomen, red LED (650-959 nm) for 20 minutes on the abdomen, and application of a bandage on the operated area.	From the data collected during the pre- and postoperative periods of the patients separated by the GC and EG groups, they were evaluated and compared. In which the variables with significant differences between the number of visits, onset of fibrosis, resolution of fibrosis and ecchymosis, perimetry on the 4th postoperative day of the iliac crest and inframammary fold and final evaluation of the inframammary fold and umbilicus were presented. The final data showed that the EG group had a greater reduction in perimetry than the CG in all different periods and anatomical parts, except for the iliac crest. The EG group received pre, trans and postoperative care. Intraoperatively, lymphatic bandages were applied to the abdomen (with a fixed base in the axillary region bilaterally) and flanks (with a fixed base in the coccygeal region of the operated region) and 360° containment foam in the operated region under the surgical mesh. The same postoperative treatment was offered to patients in the EG and CG.
2020, Santos, N. L. <i>et al.</i>	Perception of patients about professional performance and procedures performed in the pre, intra, and postoperative period of abdominoplasty.	The therapeutic resources used were: manual lymphatic drainage and ultrasound.	The final results showed that in the preoperative period, most patients reported that they had not undergone any procedure. However, those who underwent preoperative procedures reported having done it with a doctor, beautician and physiotherapist, being submitted to the manual lymphatic drainage technique for more than 3 sessions. Regarding physical therapy, they reported not having done respiratory physical therapy and consultations with the physical therapist. Intraoperatively: they reported not knowing if there was a physiotherapist in the operating room. As for the postoperative: in relation to the use of equipment, they reported not having been subjected to any type of treatment with devices. Among those who used it, the use of therapeutic ultrasound and radiofrequency were cited. Most patients reported the use of manual techniques, with manual lymphatic drainage and modeling massage, the other techniques did not obtain expressive scores.
2020, Pereira, D. S. <i>et al.</i>	Effect of myofascial release on fibrosis in the postoperative period of abdominal liposuction: a pilot study.	Manual lymphatic drainage was based on the Vodder method, with pressure of 40 mmHg, with slow and rhythmic movements. Myofascial release was performed through stimuli manuals promoting the sliding in the adjacent tissues in senses and directions that presented greater resistance and tissue stiffness in the abdomen affected by fibrosis. The time for each release was 2 to 5 minutes.	To analyze the effect of the interventions, the evaluations were carried out in two moments: pre and post intervention. Participants were divided into 2 groups: G1 received myofascial release and G2 manual lymphatic drainage using the vooder method. Thus, it was possible to notice that the experimental group showed greater satisfaction with the intervention and with the body after treatment, when compared to the control group.
2020, Valente, D.R. <i>et al.</i>	Microcurrent in the postoperative treatment of abdominoplasty surgery: case study.	The microcurrent resource was used, in which 1 daily session was performed, within a period of 30 days. Microcurrent (Versatile AF9 Tone Derm) was applied in the region of the scar using both polarities, positive and negative, establishing the parameter of 400 Hz with a time of 60 minutes in both polarities.	Regarding the healing process, there was speed, as well as in the texture of the scar, recovery of areas with hypoesthesia, reduction of lesions, edema, hematoma and ecchymosis. The volunteer showed an increase in adenosine triphosphate (ATP), which directly impacts tissue development. The use of microcurrent is essential for the synthesis of ATP, release of ions and bacteria by the electrodes and stimulation of phagocytes.



2021, Allam, A.M. <i>et al.</i>	Comparison of Extracorporeal Shock Wave Therapy versus Manual Lymphatic Drainage on Cellulite after Liposuction: A Randomized Clinical Trial.	The comparative techniques used were: manual lymphatic drainage and extracorporeal shock wave therapy.	The study was divided into group A (ESWT) and group B (DLM) in both had 15 people all female. Group A: received shock therapy twice a week for 4 weeks and topical retinol twice a day for 4 weeks. Group B: received manual lymphatic drainage twice a week for 4 weeks and retinol twice a day for 4 weeks. The values of the caliper skinfolds were obtained in group A, in which they decreased by 24.4% and in group B by 15.38%, obtaining significant results and differences between both. In addition, mean cellulite grading scale values sporadically decreased in group A compared to group B.
2021, Chi, A; Marquetti, M. G; Dias, M.	Use of <i>lymphatic</i> taping to prevent the formation of ecchymosis in abdominoplasty and liposuction.	The technique used was the lymphatic <i>taping</i> , in which the bandages acted until the 4th postoperative day. The cuts were made in "fan" or octopus, being cut in its active band and with a base of 3cm to 5cm.	The group of 20 women were divided into 2 groups: 10 in the control group (CG) and 10 in the experimental group (EG). The EG group received transoperative treatment with the application of lymphatic <i>taping</i> in the abdomen and flanks. Lymphatic <i>taping</i> was considered when cutting. The CG was assessed on the 4th postoperative day with photo documentation for analysis of ecchymosis (type, location and resolution) and VAS (visual analogue pain scale) for analysis of pain. The EG showed better response in the resolution of the ecchymosis and in the use of lymphatic taping in relation to the control group.
2022, Rostom, E. H., Salama, A. B.	Vodder manual lymphatic drainage technique versus Casley-Smith manual lymphatic drainage technique for cellulite after thigh liposuction.	The interventions used were: Vodder technique, Casley-Smith technique and bandage.	The study was divided into two groups (A and B) with 15 people in each, in which the published results reveal that there was a significant improvement in both groups using the proposed treatment techniques, the average value of the Cellulite Severity scale decreased from 12 (severe) to 4 (mild), but in the other applied scale of Cellulite Severity in both groups it was shown a relatively significant difference of their final score.

**Table 01**- Details of the articles found for the selection of the study.

the lymphatic system. Due to such recovery of the patients, it was possible to reduce the number of physical therapy sessions.

Another technique performed in combination to reduce the complication of the clinical condition of tissue fibrosis was manual lymphatic drainage associated with ultrasound, in a clinical trial involving 18 women, which showed positive results in reducing edema, fibrotic undulations and in the elimination of pain in the postoperative period of liposuction and lipoabdominoplasty, in which ultrasound was used in continuous mode with the following parameters: 3MHz frequency, intensity  $0.8 \text{ W/cm}^2$ ; and power of  $2.8 \text{ W}$  (MASSOM et al., 2014).

In addition, the 3MHz ultrasound is linked to the healing process in the immediate postoperative period, promoting a decrease in pain and edema, improvement in blood circulation, in the lymphatic system and in cellular nutrition. It is more used in the inflammatory phase to reabsorb bruises, reduce possible fibrotic formations and increase the elasticity of the connective tissue. If tissue fibrosis is installed, ultrasound becomes a coadjuvant in the process of reducing sequelae and increasing connective tissue (MEYER et al., 2011).

As well as the application of ultrasound combined with massage therapy in a quasi-experimental study with 2 women, which showed a significant reduction in measurements and improvement in the treatment of tissue fibrosis, even after one year of intervention. Ultrasound was applied in continuous mode and with the following parameters: Intensity  $1.5 \text{ W/cm}^2$  and frequency of 3MHz. The purpose of using the massage therapy technique is to release the adhesion of the fibrous tissue from the superficial and deep sliding maneuvers, kneading and friction, in addition to remodeling the adipose tissue. This technique promotes

the reorganization and deposit of collagen, reduces edema and pain, restores soft tissue mobility and prevents possible deformities (PIVETTA et al., 2011). Another resource that was effective in the treatment of tissue fibrosis was radiofrequency. Pirola, Battiston, Giusti (2011) in a case study with only 1 volunteer used this resource in a subjective and visual way to improve the appearance of the skin, showing a reduction in fibrotic areas. Being used as parameters: Frequency of 1MHz, bipolar system with the body electrode at 70% of the intensity and with the applicability of 5 minutes in each fibrous area, with temperature between  $38^\circ$  to  $40^\circ$ , in which it provided the rupture of the fibrous networks, retraction of the septa and stimulation of neocollagenesis, after the completion of the consultations, the volunteer wore the compressive belt. Silva et al., (2012) point out the resource as effective both in recent and late treatment, provided that the edema is not accentuated and the patient's thermal sensitivity is preserved.

In addition, the myofascial release technique was associated with the treatment of tissue fibrosis, in a pilot study with the participation of 6 women, in which there was an improvement in the aspect of the complication, tissue thickness and greater transparency of the body curvature. Due to the tissue stimulus, there was a greater formation of collagen bundles and tissue reorganization, in addition, it was possible to mobilize other tissues in addition to the subcutaneous tissue, such as muscle and joint (PEREIRA et al., 2020).

Thus, another electrotherapeutic resource found in the studies was the application of microcurrent related to the anchor-type healing process, in which its final result was also associated with specialized care in the postoperative period, with an improvement in the movement of the sutured region and scar texture being observed. In addition, the

case study with a qualitative approach and descriptive method had the participation of only 1 volunteer, in which she showed an increase in the production of adenosine triphosphate, which directly impacts the evolution of the healing process. This feature was applied with both polarities, positive and negative, with the following parameters: Frequency 400HZ for both polarities with a duration of 60 minutes for each polarity (VALENTE *et al.*, 2020).

Furthermore, the low power laser was applied in the complication of cicatricial dehiscence in order to promote tissue recovery, this is due to the biomodulation process that promotes collagen synthesis and rescues the energetic function of the cell. In addition, an improvement in the inflammatory process, tissue reorganization and wound closure was observed, being applied for 12 seconds with 6 J/cm<sup>2</sup> of power, occasionally without contact with the patient's skin. However, the volunteer in the present study was using drugs, which possibly may have contributed to the evolution of the condition (ROQUE *et al.*, 2017).

Consequently, another complication resulting from liposuction surgery is cellulite. In the clinical trial study by Allam *et al.* (2021), in which 30 women participated, compared the effects between extracorporeal shock wave therapy and manual lymphatic drainage, concluding that wave therapy presented more effective results for minimizing the degree of cellulite, in addition to leveraging the process of microcirculation and transport of lymphatic vessels, the parameters used were: frequency 3.5Hz, flow density 0.16 mJ/mm<sup>2</sup> and 2,000 shot in the anterior portion of the thigh. However, lymphatic drainage also showed positive results, but they were not superior to waves.

On the other hand, in a clinical trial in which 30 women participated, a comparison was made between the Vodder and Casley-

Smith manual lymphatic drainage techniques for cellulite in the thigh region, in which it was possible to observe a positive result. in the reduction of these waves, however, it was not possible to perceive a significant difference between the chosen techniques, both presented similar results in the Cellulite Severity Scale, going from a score of 12 (severe) to 4 (mild) (ROSTOM; SALAMA, 2022).

Thus, it can be concluded that the individualized physiotherapeutic treatment, with variables, well planned, respecting the needs and complications of the patient, analyzing the stages of tissue repair and the period in which it is found, it is possible to obtain positive results. in relation to the reduction of the condition and/or complete rehabilitation of the complication (SILVA *et al.*, 2012).

## CONCLUSION

From the analysis carried out on the selected articles, it can be seen that the final data showed positive results in the importance of manual and electrotherapeutic therapeutic resources in the reduction and/or recovery of patients who presented complications in the postoperative period of abdominoplasty and liposuction, provided that this protocol be individualized and specified for each case. Among treatments, manual lymphatic drainage and *lymphotaping* predominated, with tissue fibrosis being the most recurrent complication.

However, despite the study having obtained positive results and having achieved the proposed objective, it is necessary to emphasize the limitations of the techniques and resources used for the treatment of complications resulting from the postoperative period of these surgeries, therefore, it is necessary to carry out more studies regarding the resources and techniques used to minimize and/or recover from these complications, in order to

obtain larger samples and better results.

Therefore, this study provides professionals with a resource guide that can help in certain complications, in addition to demonstrating

the importance of the physiotherapeutic role in the postoperative period of these surgeries.

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