INTERNATIONAL RESEARCH GROUP

Study in association with the company:

BODY HEALTH®

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PROJECT REPORT

INSTITUTE
PATRICIA FROES
TRAINING AND DEVELOPMENT - SCHOOL CLINIC

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ANALYSIS OF THE PERFORMANCE OF CRIOFREQUENCY IN THE DERMAL AND HYPODERMAL FABRIC: CASE STUDY

- Study in association with the company BODY HEALTH

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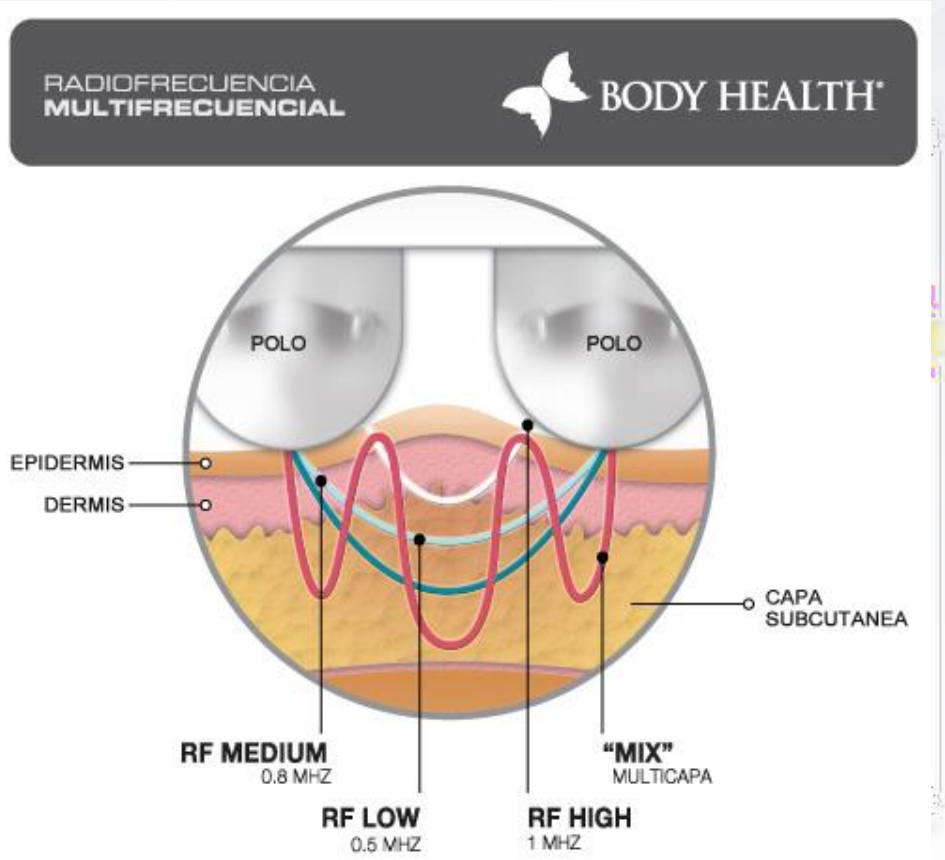
¿What is CRYOFREQUENCY?

Cryofrequency is an aesthetic therapy for various treatments, It`s a device that use electromagnetic waves to reach the deep dermis producing enough heat to create collagen synthesis

DIFFERENCE BETWEEN CRYOFREQUENCY AND RADIOFREQUENCY

Cryofrequency, unlike radiofrequency, makes a “thermal shock” in the tissue, thanks to the combination of radiofrequency and a cooling performed simultaneously in the same applicator, which generates an instantaneous skin tightening.



OBJECTIVES OF THE STUDY

GENERAL:

- **Verify the effectiveness of Cryofrequency in the dermis and hipodermis.**

SPECIFIC:

- **Histologically demonstrate the effects of cryofrequency at the dermal and hypodermic levels.**
- **Demonstrate, through immunohistochemistry, the effects of Cryofrequency at the dermal and hypodermic levels.**
- **Endorse if weight alteration occurred after the application of Cryofrequency.**
- **Examine alterations in relation to localized measures through perimetry, plicometry and ultrasonic ultrasound after the application of Cryofrequency.**

STUDY DESING

CASE STUDY

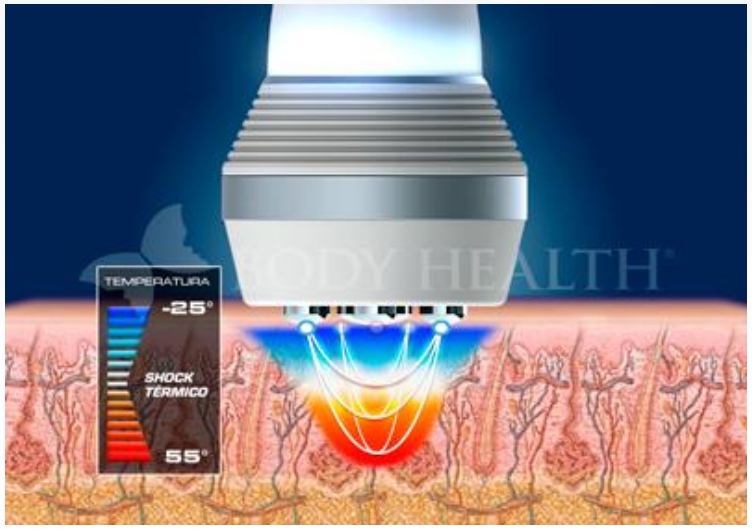
- THE SAMPLE: An 45 yeara old volunteer, whith subcutaneous adiposity located in the supra and infraumbilical region and is going to have a tummy tuck

TREATMENT

- One weekly session, totaling 04 sessions

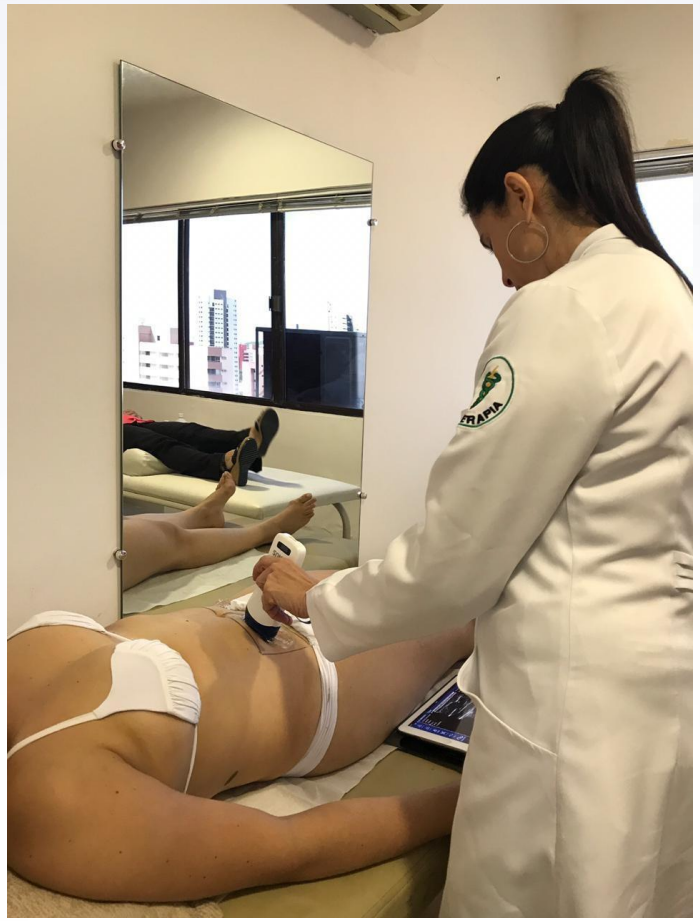
MATERIALS

CRYOFREQUENCY
BSH 156 - Bodyhealth

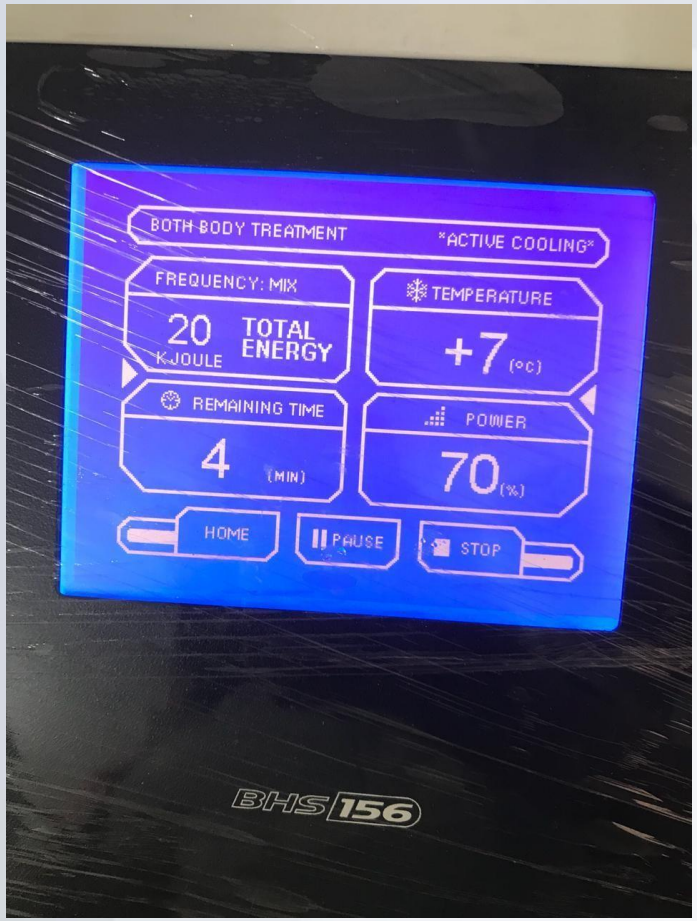


METHODOLOGY EVALUATION

Preoperative analysis



APPLICACION PARAMETERS



- **Application time:**
  04 minutes for handlebar area
- **Total time:**
  16 minutes
- **Temperature : -10ºc**
- **Power: 85%**
- **Total energy: 96 kJ**
- **Mode: multi + mono**

Anthropometric Data

Wheith

- Initial: 59,7kg
- Final: 59,4 Kg

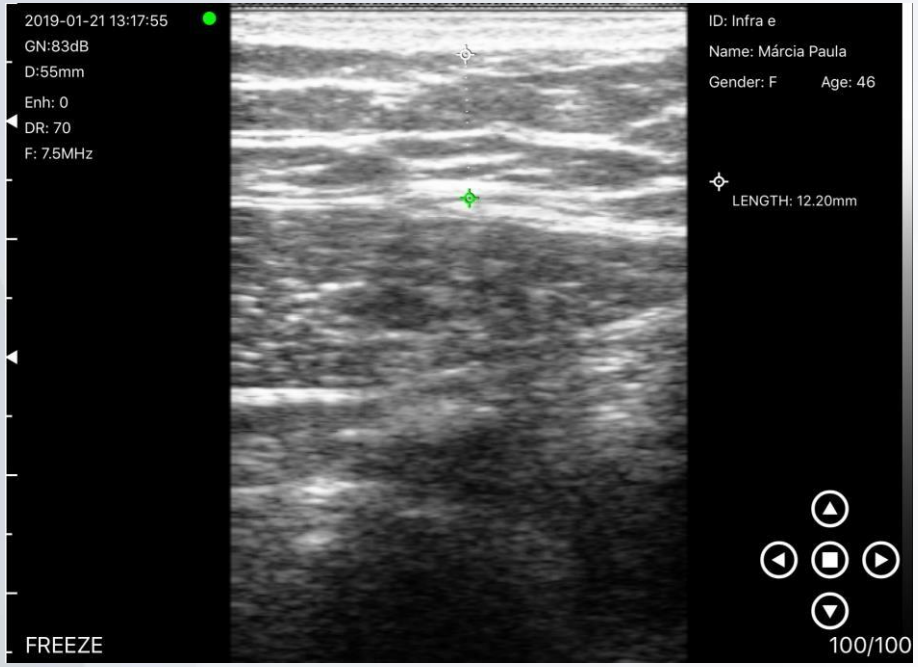
Infraumbilical Measure

- Initial: 90 cm
- Final: 88cm

INFRAUMBILICAL REGION MEASURES BY ECOGRAPHY

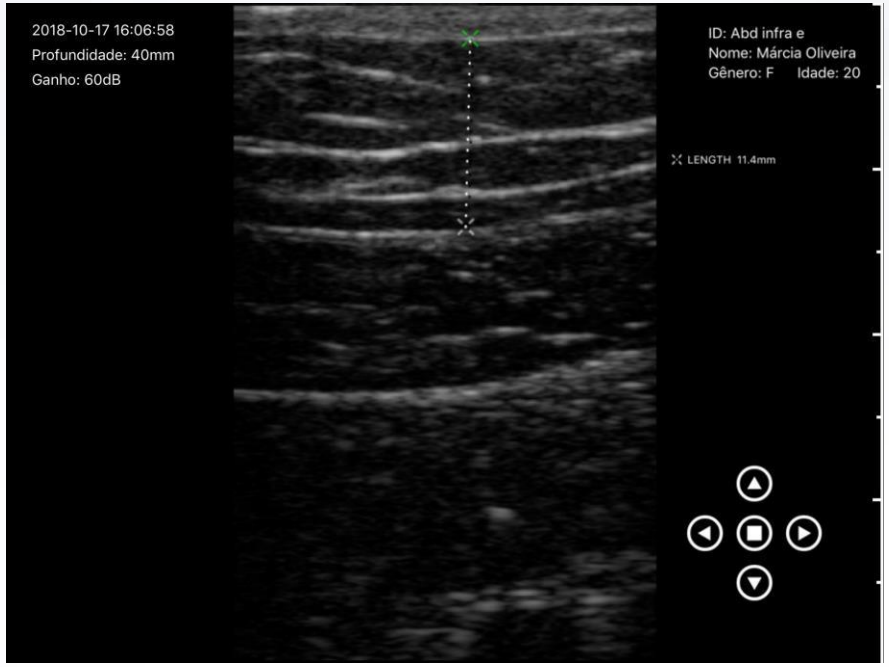
- **CONTROL SIDE**

18/12/18



12,20 cm

21/01/19

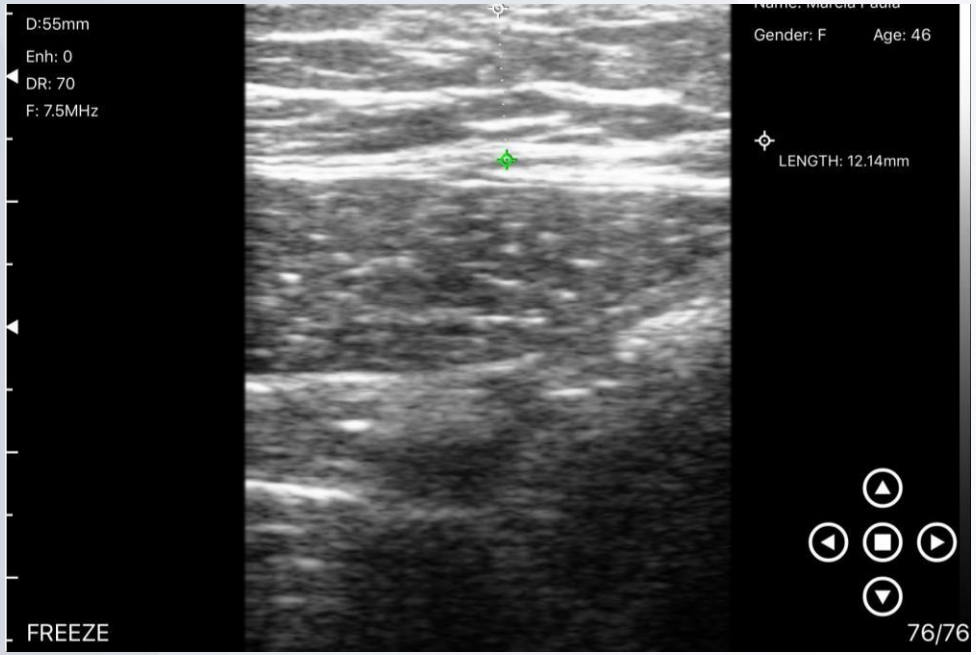


11,40 cm

INFRAUMBILICAL REGION MEASURES BY ECOGRAPHY

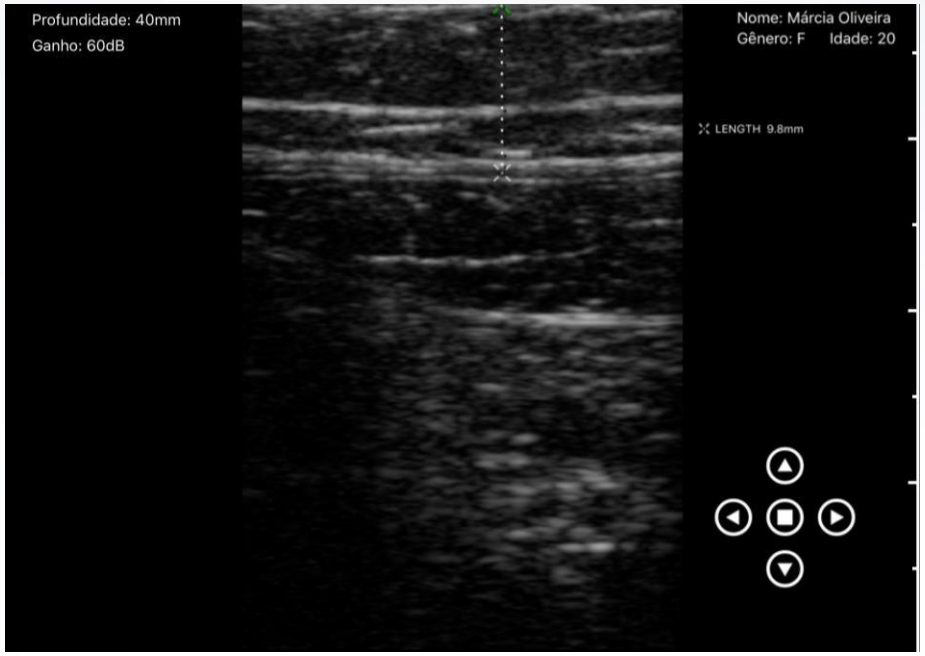
- **TREATED SIDE**

18/12/18



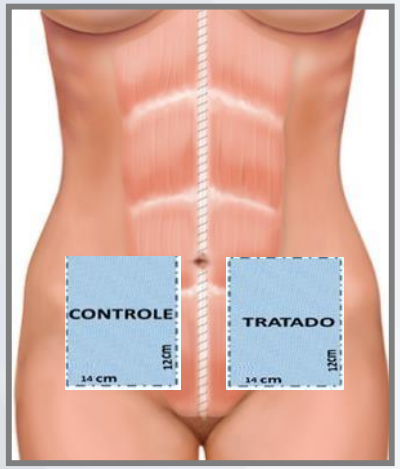
12,14cm

21/01/19

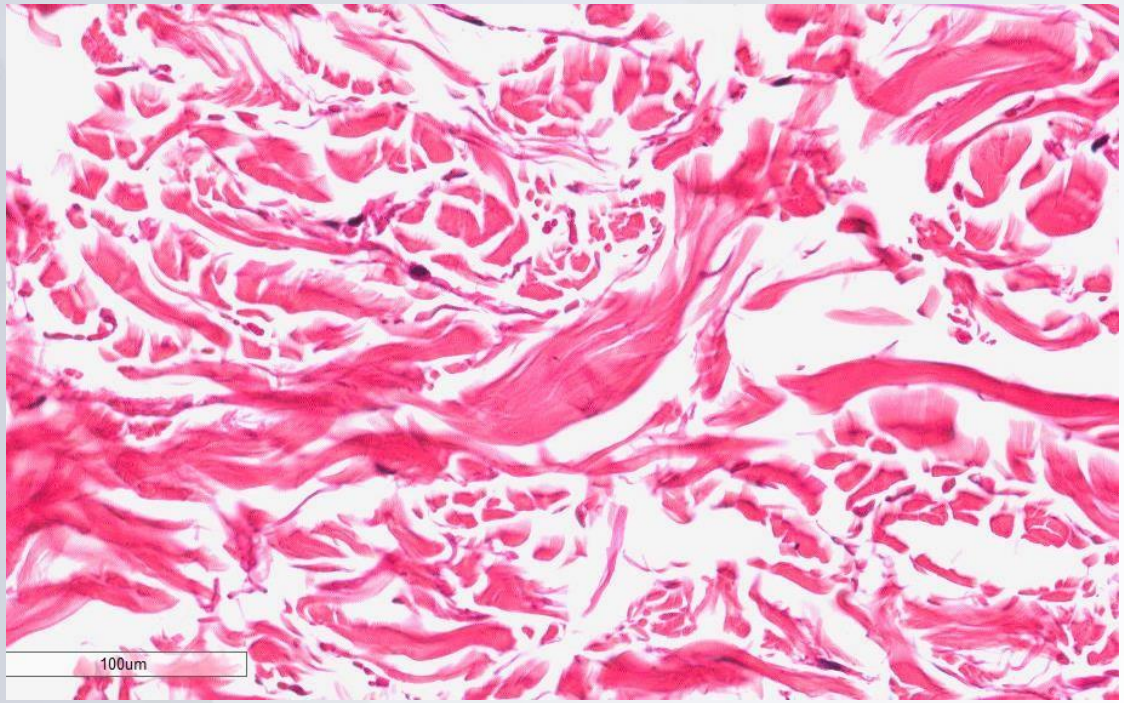


0,98cm

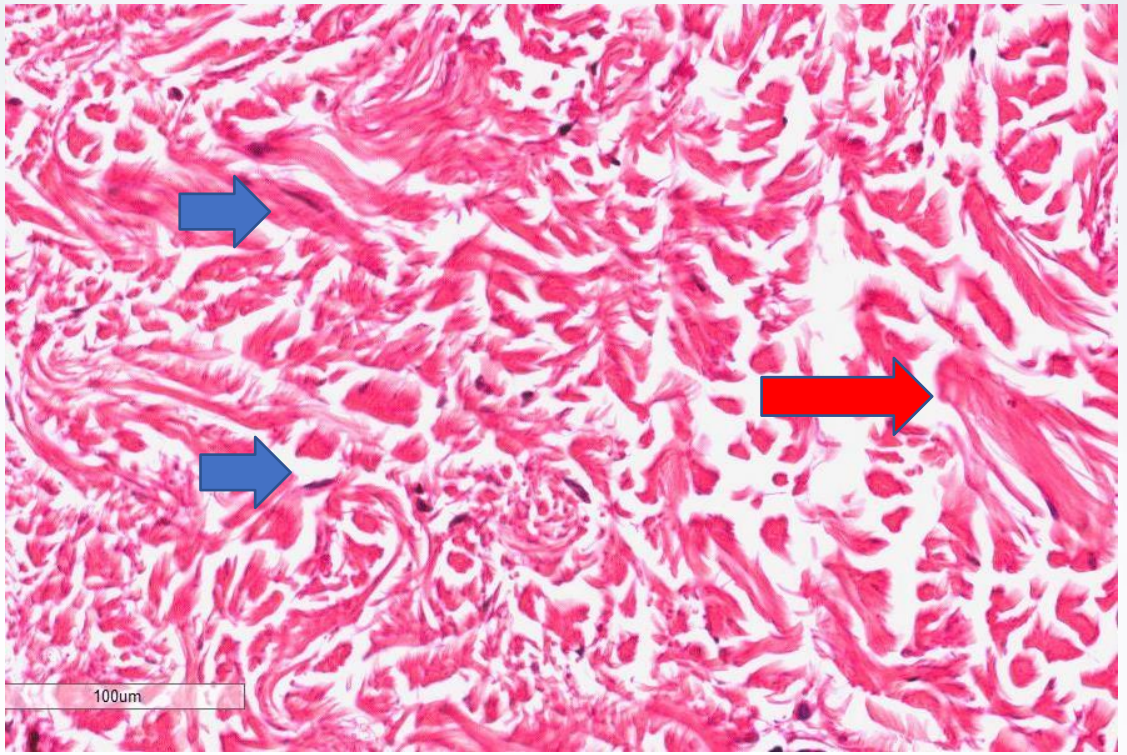
REMOVED SURGICAL SECTOR FOR ANALYSIS



CONTROL



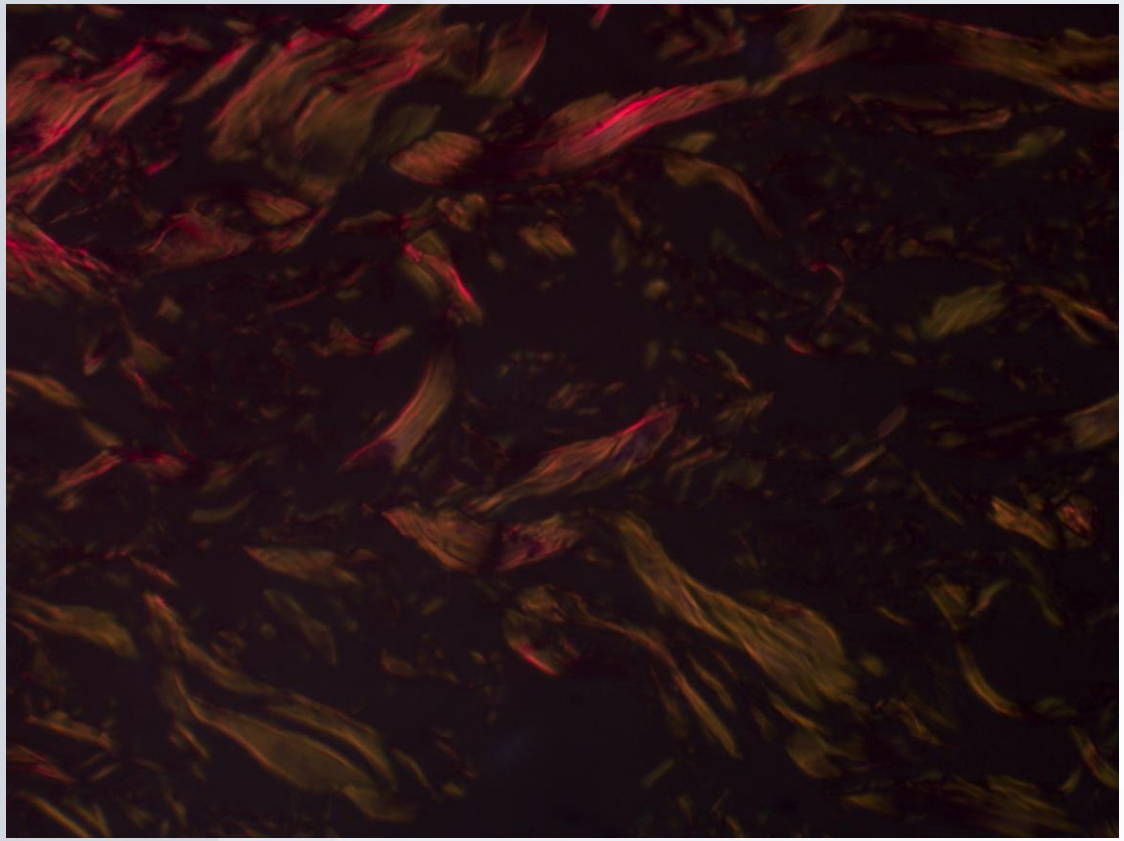
TREATED



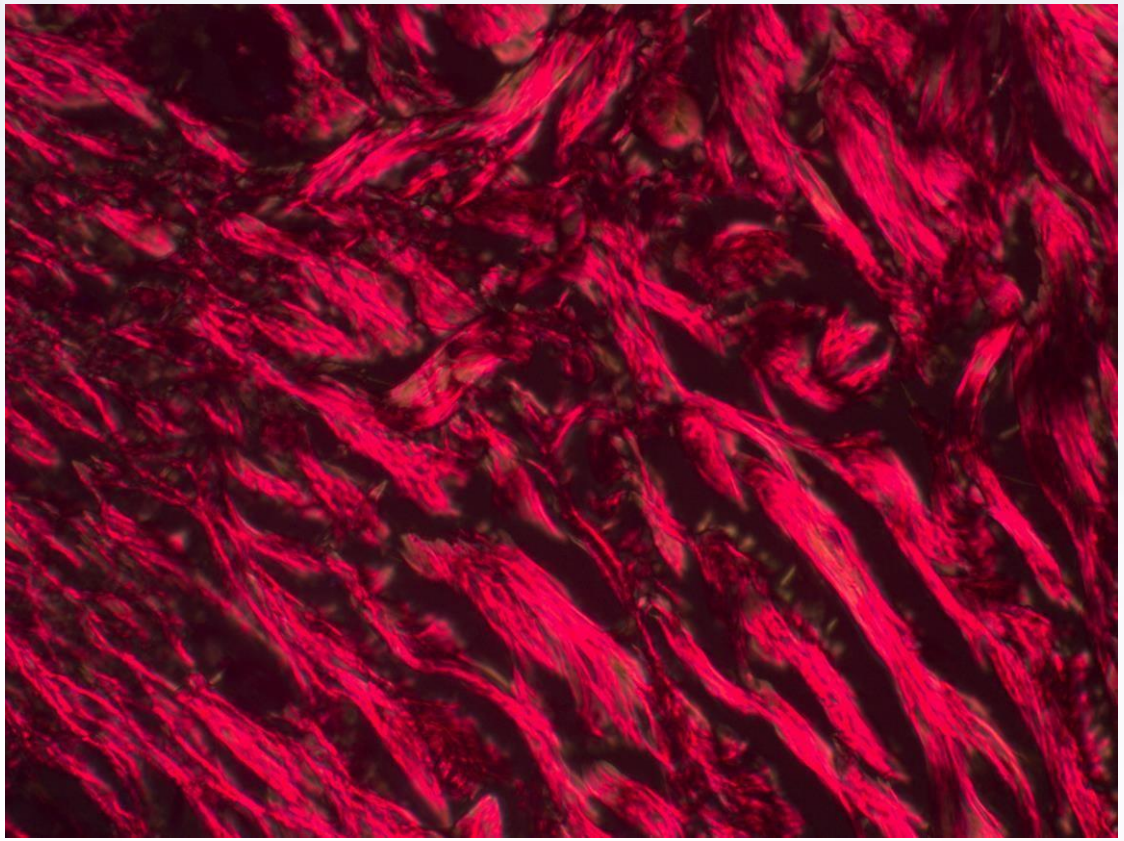
Control group with few old collagen cells.

Treated group with a large amount of active fibroblasts (blue arrows) and neoformed collagen (red arrow)

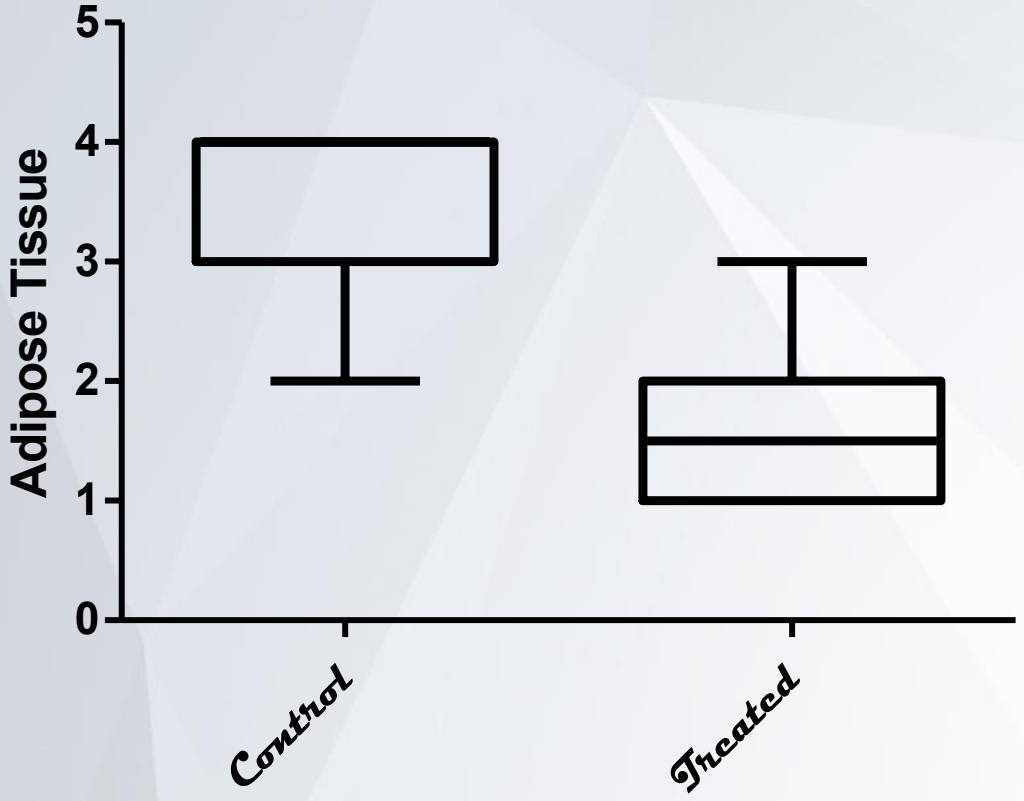
CONTROL

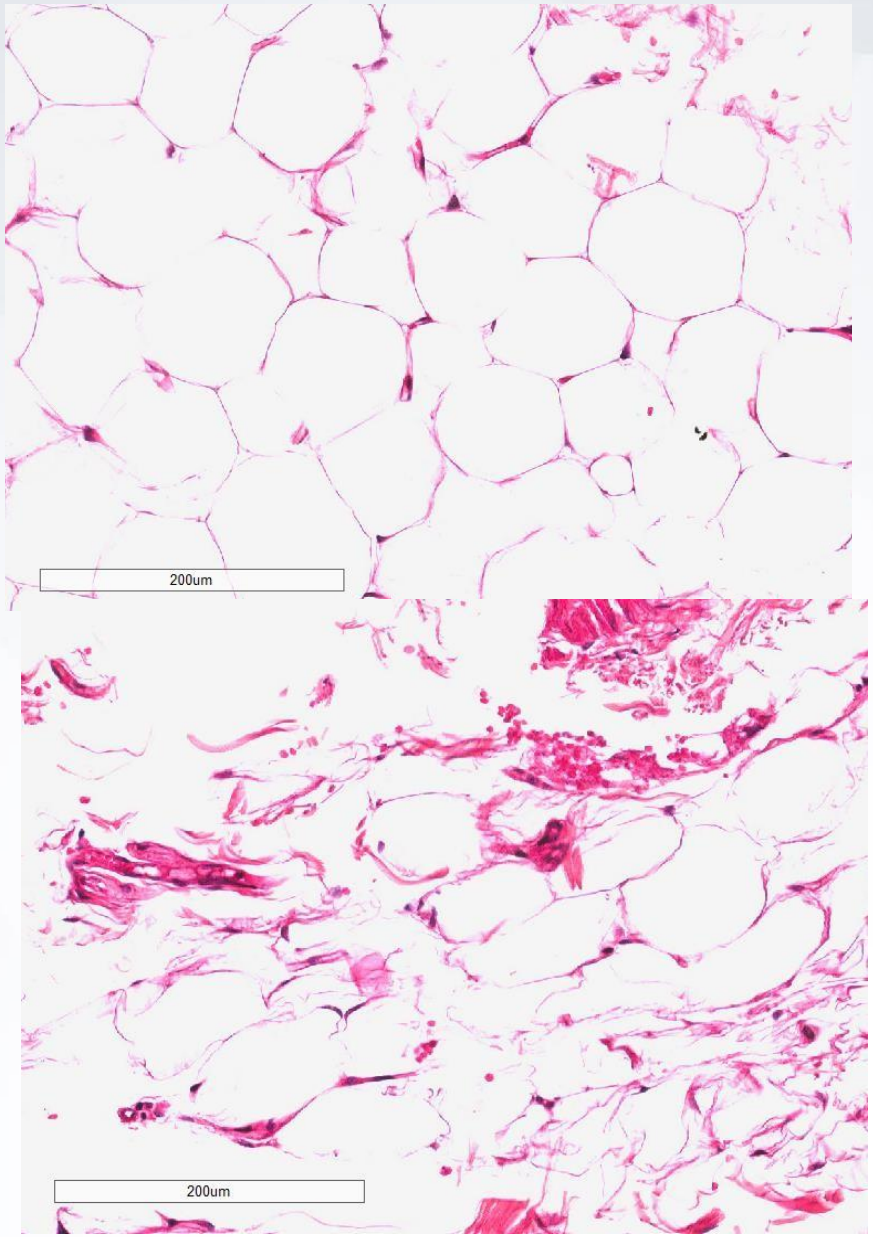


TREATED



Type I collagen (red), type III collagen (green)
Control group with a lot of type III collagen
Group treated with a large amount of new collagen, type I





Control: Adipose tissue with normal characteristics

Treated:

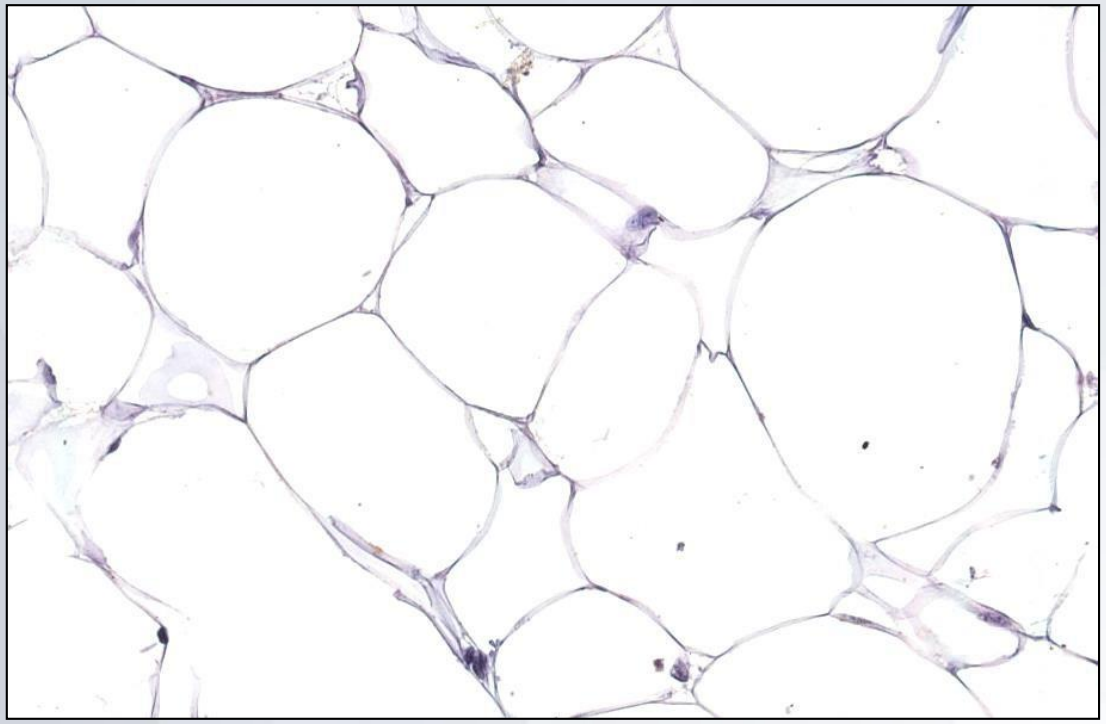
Adipose tissue degenerating.

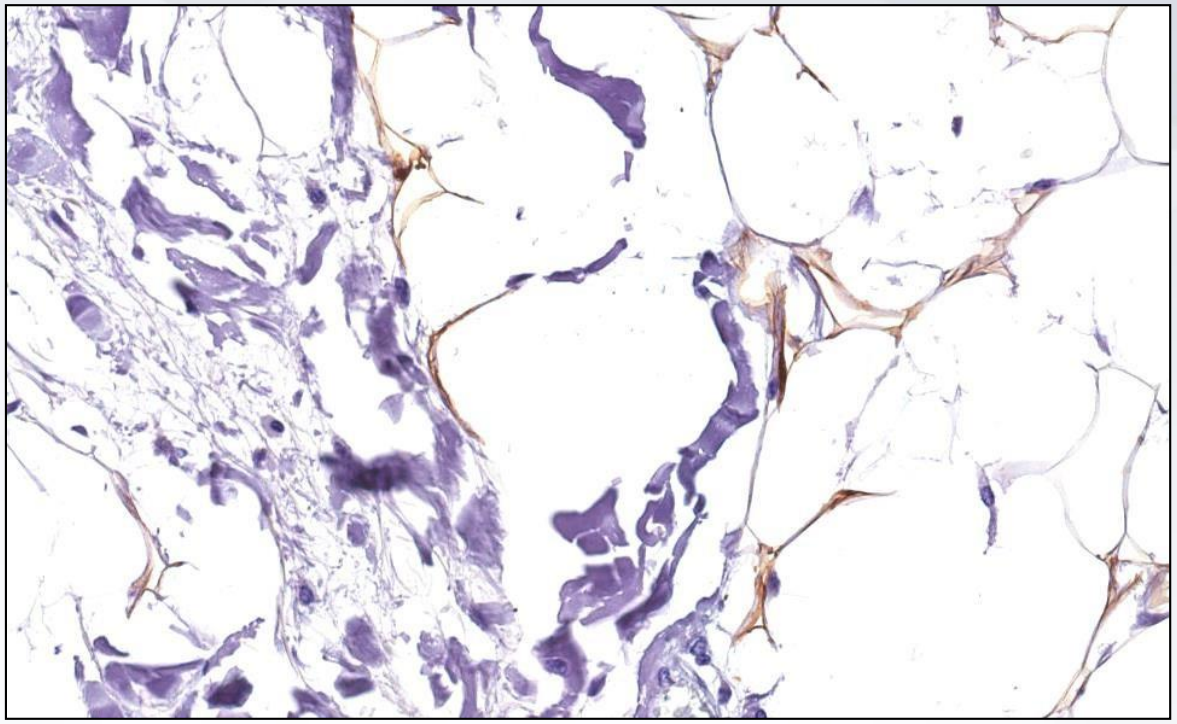
Caspase 3 expression analysis (apoptosis of adipose tissue)

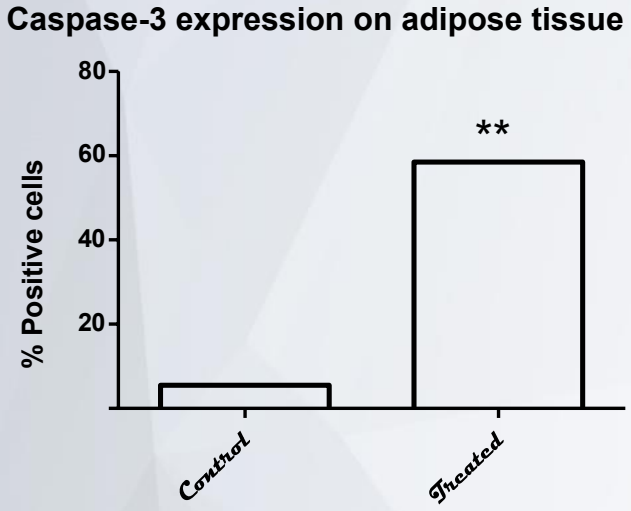
• The enzyme caspase-3 is a member of the family of endoproteases that regulate the signaling networks of inflammation and apoptosis. Caspase-3 is known as an executing caspase in apoptosis due to its role in coordinating the destruction of cellular structures, such as DNA fragmentation or the degradation of cytoskeleton proteins.

• Caspase-3 when expressed in adipose tissue indicates presence of apoptosis, and consequent degeneration of that tissue.

- *Tinahones et al, Diabetes Care, 2013*







** P<0.05 (teste t)

- **The greater expression of caspase-3 in the adipose tissue of the treated group indicates an increase in apoptosis, consequent greater degeneration of that tissue.**

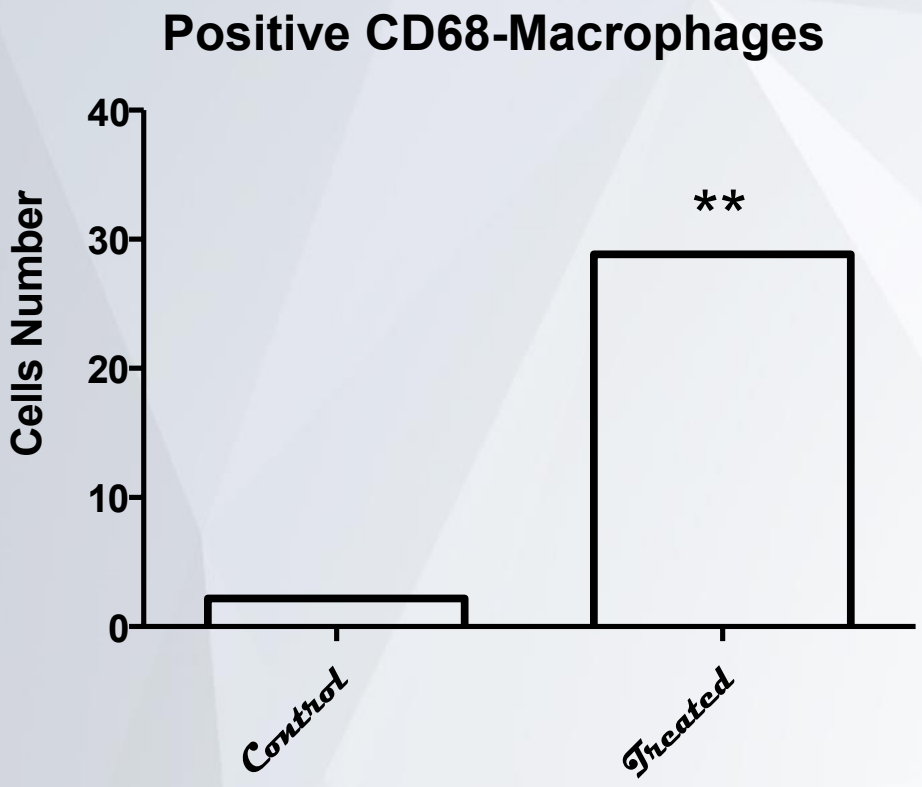
CD68 expression analysis (macrophages)

- The presence of macrophages is associated with a greater degeneration of adipose tissue.

- The CD68 molecule is a glycoprotein The CD68 molecule is a 110 kD intracellular glycoprotein, associated with cytoplasmic granules and, to a lesser extent, macrophage membranes.

- *Moreno-Navarrete al (2013)*

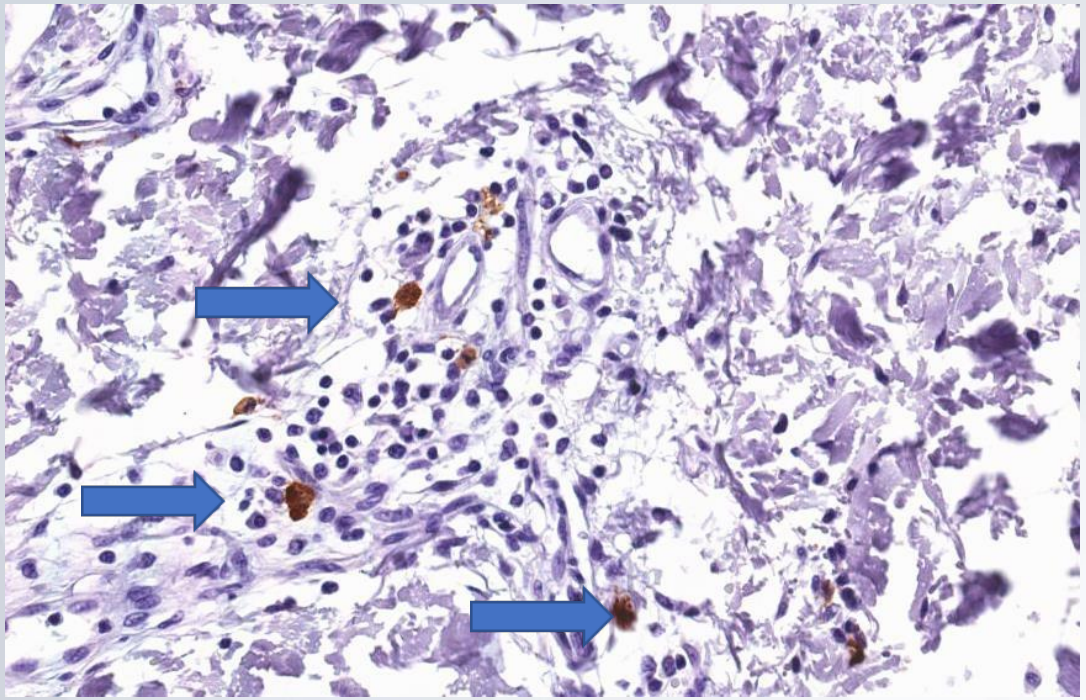
CD68 expression analysis (macrophages)

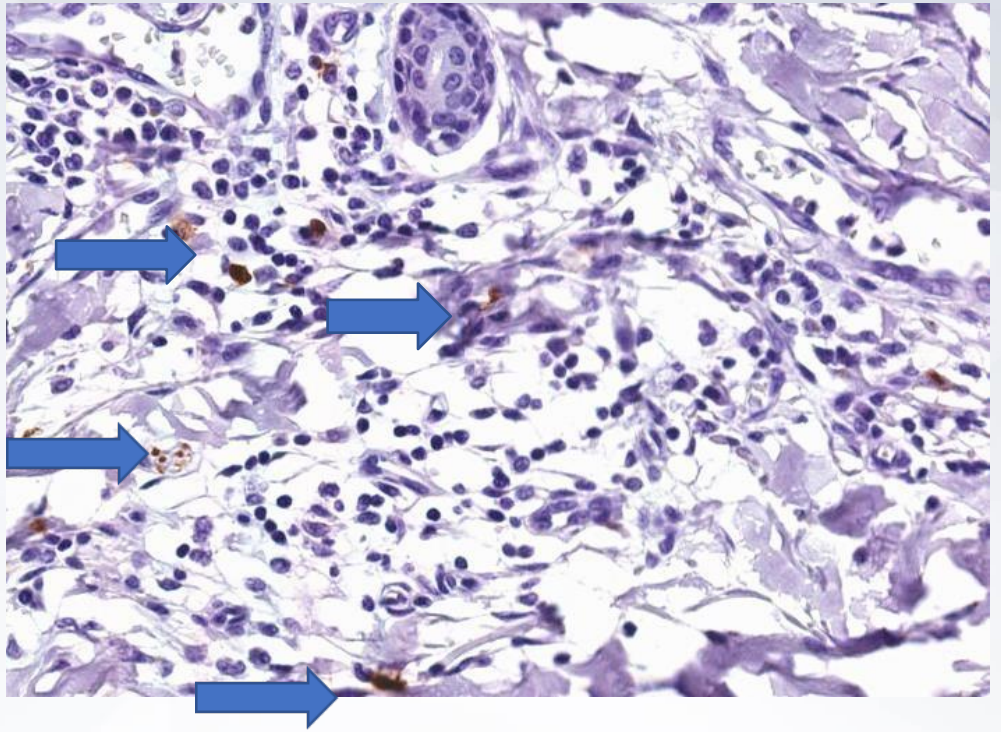


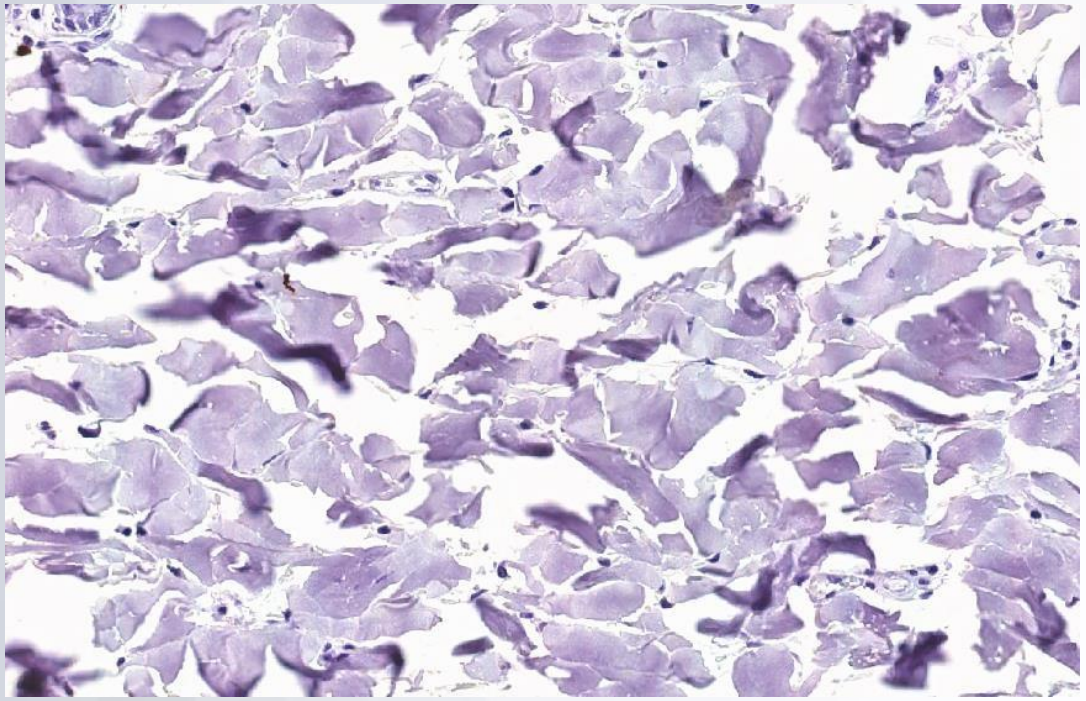
** P<0.05 (test t)

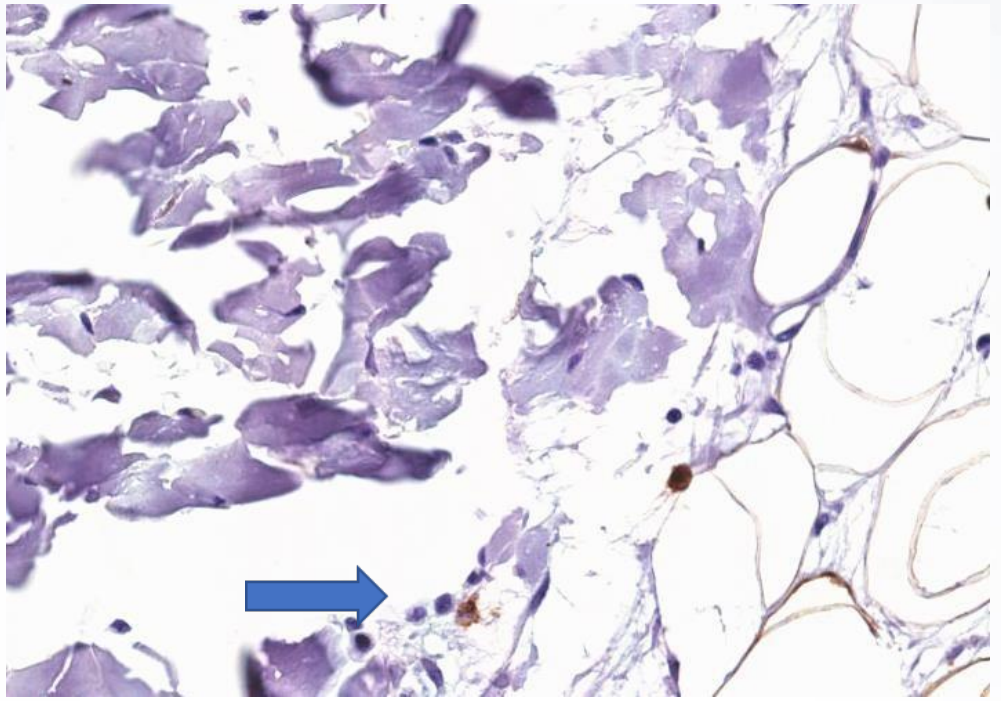
- In the treated group there was an increase in the number of macrophages, demonstrating the reaction of CD68.

- We can conclude that the treatment could induce the degeneration of adipose tissue by two mechanisms: activation of apoptosis and activation of inflammatory cells, especially macrophages that phagocytize apoptotic tissue.





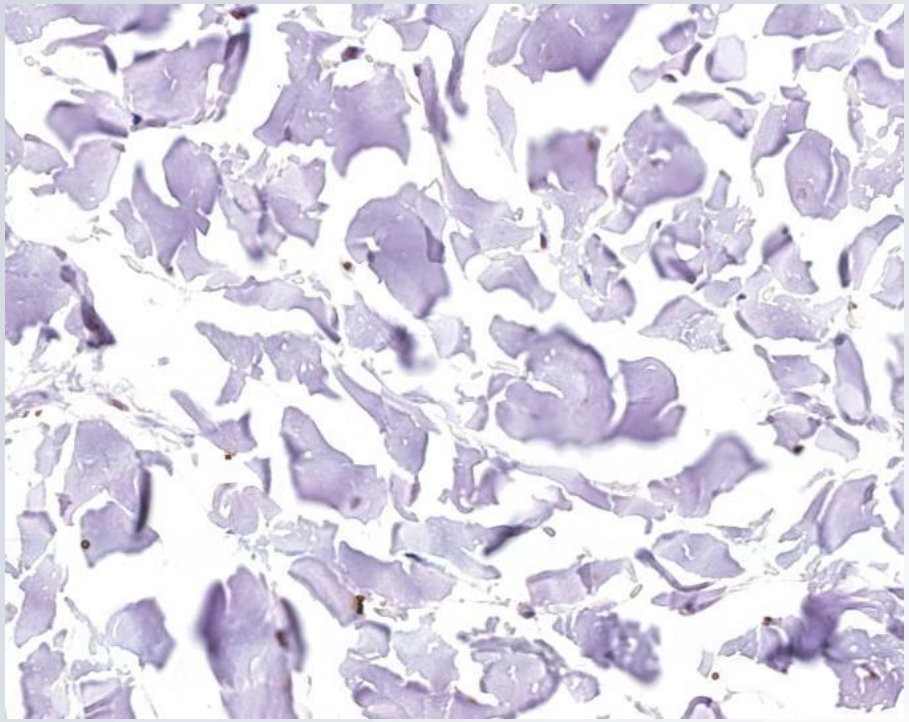


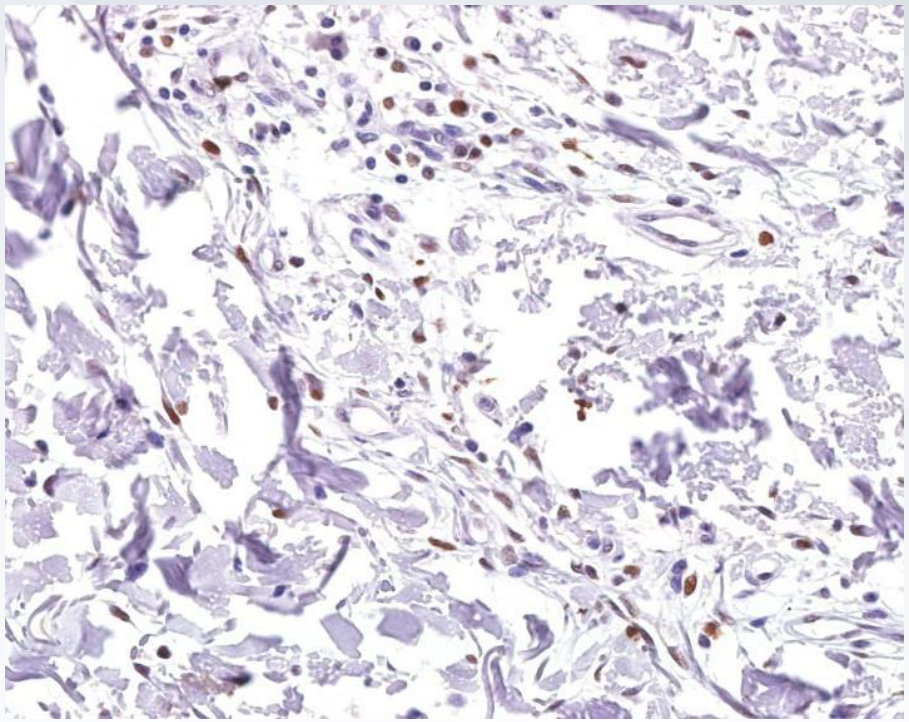


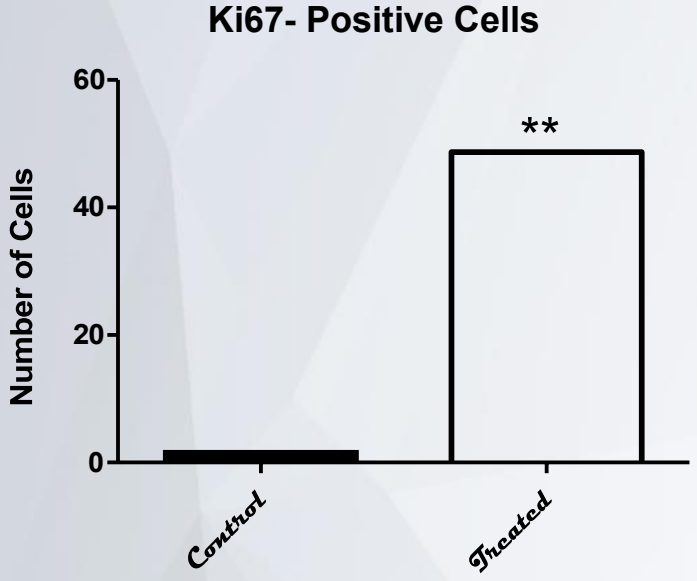
Analysis of Ki67 expression (cell proliferation)

- The Ki67 antigen is a nuclear protein. The Ki67 antigen is a nuclear protein that is expressed in all active parts of the cell cycle (G1, S, G2 and mitosis) but is absent in resting cells (G0).
- Therefore, the presence of the Ki67 antigen is strictly associated with the cell cycle and limited to the nucleus, suggesting an important role in the maintenance and / or regulation of the cell division cycle.
- Ki67 expression in fibroblast nuclei, connective tissue cells and inflammatory cells may indicate a greater proliferation of those cells..

- *Gasparri et al, (2004)*







** P<0.05 (teste t)

- A significant increase in the number of fibroblasts and inflammatory cells positive for Ki67 was observed in the treated group, indicating increased activity in the dermis of treated patients compared to the control.
- These results collaborate with the increased production of collagen type I, observed in the morphological analysis.

CONCLUSION

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- Cryofrequency manages to treat both flaccidity and localized adiposity, a fact proven by histological and immunohistochemical findings.

- The type of collagen produced with the Cryofrequency was type III and type I, with greater firmness and better quality.

CONCLUSION

- The presence of caspase-3 indicated and confirmed apoptosis, the presence of macrophages phagocytose degenerating cells.

- The presence of Ki67 demonstrates that the fibroblast is stimulated and the production of collagen is justified by the cryofrequency technique.

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CONCLUSION

- The amount of adipose tissue on the treated side was smaller and statistically there was a significant reduction when the sample cells were counted.

- A greater amount of collagen wa s perceived on the treated side, In addition to a higher quality of this collagen.

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