



Rhytidoplasty practices and histological notes for the facial skin of post-bariatric patients

Conduitas na ritidoplastia e apontamentos histológicos na pele da face do paciente pós-bariátrica

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■ ABSTRACT

Introduction: The number of patients classified as overweight or obese has resulted in an increased number of post-bariatric patients, generating a demand for rhytidoplasty in this public profile. expose the routine and surgical tactics in a teaching hospital, patient profiles, subcutaneous cellular tissue, and the superficial musculoaponeurotic system are compared between post-bariatric and non-post-bariatric patients, as well as histological superficial comparison of the skin. **Methods:** A review of the data of 32 cases treated in 2012–2016 was conducted in a public hospital in Goiânia-GO.

Results: The tactics of rhytidoplasty used in post-bariatric patients do not differ significantly from those used in non-post-bariatric patients. A histopathological analysis of the collected samples showed marked differences between post-bariatric and non-post-bariatric patients. **Conclusion:** The surgical technique of rhytidoplasty of post-bariatric patients sustained specific details with satisfactory post-operative surgical results, skin with worse histological quality, perioperative complications within the expected range, and the need for further studies to assess the procedure's durability

Keywords: Rhytidoplasty; Bariatric medicine; Therapeutic practices; Histology; Face.

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■ RESUMO

Introdução: O número de pacientes classificados com sobrepeso ou obesos e, com isso, dos pacientes pós-bariátricas vem aumentando, gerando uma demanda por ritidoplastias neste perfil de público. O objetivo é expor a rotina e táticas cirúrgicas em um hospital de ensino, o perfil destes pacientes, além de um comparativo superficial histológico da pele, tecido celular subcutâneo e SMAS, entre os pacientes pós e não pós-bariátrica. **Métodos:** Foi realizada revisão de dados do centro cirúrgico e de prontuário entre os anos de 2012 e 2016 em um hospital público na cidade de Goiânia-GO, com levantamento de 32 casos. **Resultados:** A tática de ritidoplastia utilizada nos pacientes pós-bariátrica não apresenta grandes diferenças entre a utilizada nos pacientes não pós-bariátrica. A análise histopatológica das amostras colhidas evidenciou diferenças marcantes entre os pacientes pós e não pós-bariátrica. **Conclusão:** Percebeu-se que a técnica operatória na ritidoplastia do paciente pós-bariátrica sustentou detalhes específicos, com resultado cirúrgico pós-operatório satisfatório, uma pele de pior qualidade histológica, com complicações perioperatórias dentro do esperado e com necessidade de maiores estudos para avaliar durabilidade do procedimento. **Descritores:** Ritidoplastia; Medicina bariátrica; Conduas terapêuticas; Histologia; Face.

INTRODUCTION

The number of patients classified by the World Health Organization (WHO) as overweight (body mass index [BMI] > 25 kg/m²) or obese (BMI > 30 kg/m²)¹ has been increasing in developing and developed countries, with an estimated 1.7 billion people in these categories². Thus, the number of patients who manage to lose weight through lifestyle changes or bariatric surgery is also increasing.

Despite the advantages and disadvantages associated with great loss of adipose tissue after bariatric surgery, excess skin remains thereafter. This can be considered unesthetic to society and the patient himself, causing a psychological impact³, which creates a demand for surgical repair involving dermolipectomy in about one third of patients who stabilize their weight².

Reparative plastic surgeries of patients after massive weight loss (MWL), that is those who lose at least 45 kg or 50% of their body weight, have recently increased^{2,4}; among them, rhytidoplasty is the least performed since the face is generally less affected by substantial fat loss^{2,5,6}. However, the demand for this surgery is growing.

Patients in whom weight loss affects the face present with a cutaneous surplus and laxity of the platysma muscle, developing something similar to a “jowl,” “dewlap,” or “turkey neck”^{2,6,7} besides evident

nasogenian grooves in the middle region of the face, chin, perioral and periorbital areas, and eyelids, as well as the tip of the nose and earlobes in such a way that the context contributes to the aspect of early aging.

To correct this aspect with the most esthetic and lasting results possible, we used several surgical tactics that still meet patients’ tissue quality. Due to the fact that postoperative bariatric patients do not adequately absorb nutrients, they end up experiencing a loss of skin tone and consistency and the superficial musculoaponeurotic system (SMAS)^{4,8-10}.

OBJECTIVE

This study aimed to explore the routine surgical tactics in the treatment of cutaneous flaccidity and the SMAS in the face, neck, and platysma muscle of post-bariatric patients in a teaching hospital, in addition to a superficial histological comparison between their skin, subcutaneous cellular tissue, and the SMAS and those of the non-post-bariatric ones, showing the experience of the authors.

METHODS

Operating room and medical record data of 2012–2016 were reviewed, and we surveyed all post-bariatric patients who underwent rhytidoplasty at the Dr. Alberto Rassi Hospital – General Hospital of Goiânia (HGG) in

Goiânia-GO. The authors of this study declare that the principles of the Declaration of Helsinki revised in 2000 were followed, as was Resolution 196/96 of the National Health Council. All patients signed an informed consent form prior to surgery. The present study was approved by the Research Ethics Committee of Dr. Alberto Rassi Hospital - HGG.

Patients who underwent rhytidoplasty after losing at least 22 kg or 23% of their body weight by bariatric surgery regardless of the technique and who achieved weight stability for at least 18 months were included in the study.

We aimed to determine the number of primary and secondary cases and stratify them by sex, mean age, BMI at the time of surgery, and intra- and postoperative complications.

Rhytidoplasty was the technique most commonly used by the team. This technique started with an anesthetic procedure, most of it being performed using the infiltration of anesthetic solution (0.5% lidocaine) and adrenaline (1:160,000 dilution); one extremely collaborative patient allowed the use of local analgesia only. We marked the facial midline, the area to be detached (lateral zygomatic, preauricular, posterior mandibular, and cervical regions), and the site to be incised (preauricular, intracapillary temporal, and retroauricular contour) (Figure 1). The platysma muscle was accessed using a submental incision, enabling its plication, treatment with poliglecaprone 4.0, and simple stitches with spilled knots. In the face's detached lateral region, marking of the SMAS redundant portion is performed, plication may be performed^{5,11}, or when the tissue is exuberant and presents with bulging by simple plication, SMASectomy may be performed (Figure 2). The skin flap is repositioned via resection of its excess (Figures 3 and 4) and sutured by planes with poliglecaprone 5.0 and Prolene 5.0 continuous stitches. In men, the technique is different in that we make an incision in the rib fold region. In all cases, a vacuum drain is introduced; it is removed when the output is equal to or less than 20 mL/24 hours and the aspect is serous.

Suture removal occurs at 5–10 days postoperative, with weekly return up to 28 days and results evaluated after 4–6 months.

The service routinely pays special attention to the patient's nutritional status and provides nutritional supplementation (vitamin B12, elemental iron, fat-soluble vitamins, calcium citrate, protein, etc.) whenever the results for a control laboratory test were altered in the presurgical evaluation. Whenever possible, the parenteral route was preferred for supplementation, which lasted for the period necessary



Figure 1. Marking of the planned incisions.



Figure 2. Removal of the superficial musculoaponeurotic

to achieve the goals (minimum laboratory reference values).

Histopathological study of the skin, fat tissue, and SMAS of randomized patients was performed



Figure 3. Flap positioning.



Figure 4. Immediate result.

for comparative analysis. Samples were collected during the rhytidoplasty procedure from 6 randomly chosen post-bariatric patients at 1 year postoperative in the digestive tract and compared with 4 non-post-bariatric patients (who, for this reason, did not

participate in the study sampling). The mean age of the post-bariatric patient group in this sample was 51 years, while that of the group of non-post-bariatric patients was 59 years. There was no sex-based difference in these sample groups. Samples were collected and immediately fixed in 10% formaldehyde solution. The fixed material was embedded in paraffin and subjected to microtomy and specific staining. The prepared samples were referred for analysis by the same pathologist, who followed a staining protocol consisting of hematoxylin and eosin in addition to Masson's trichrome. They were then subjected to a 100× and 200× optical microscopy assessment and images were obtained using a digital camera coupled to the microscope.

RESULTS

During the analysis period, 32 patients (24 women, 8 men; mean age, 55 years; age range, 46–61 years) underwent surgical treatment (Figures 5 and 6) and achieved weight stability for a mean 3.5 years. All patients underwent primary rhytidoplasty.



Figure 5. A. Preoperative frontal view. B. Late postoperative (6 months) frontal view. C. Preoperative lateral view. D. Late postoperative (6 months) lateral right view.



Figure 6. A. Preoperative frontal view. B. Late postoperative (6 months) frontal view. C. Preoperative lateral right view. D. Late postoperative (6 months) lateral right view.

The patients had a mean BMI at the time of surgery of 27.4 kg/m² (Table 1). The mean weight loss was about 40% of the initial weight, approximately 47 kg (Table 2). No intraoperative complications were reported; regarding postoperative complications, there were reports of small foci of unilateral preauricular epidermolysis in 6 cases (18.8%), which were treated with usual dressings and small volumes of unilaterally organized hematomas, as well as preauricular in 8 cases (25.0%), 4 of which were concomitant with epidermolysis (Table 3) and treated with simple drainage. The procedure lasted for a mean 4 hours and 20 minutes.

Histopathological analysis of the samples collected from the skin (Figures 7, 8, 9 e 10), adipose tissue (Figures 11 e 12), and SMAS (Figures 13 e 14)

Table 1. Distribution of surgical patients by sex and age at the time of surgery.

Variable	Frequency	
	n*	%
Sex		
Male	8	25.0%
Female	24	75.0%
Age		
45-55	15	46.9%
55-65	17	53.1%

*n = número de pacientes.

Table 2. Distribution of surgical patients by mean BMI at the time of surgery and mean weight loss before the procedure.

Variable	Frequency	
	n*	%
BMI (kg/m ²)		
18.5-24.9	15	46.9%
25.0-29.9	10	31.2%
30.0-34.9	7	21.9%
Weight loss (kg)		
20-35	10	31.3%
36-50	8	25.0%
51-65	12	37.5%
66-80	2	6.3%

BMI, body mass index; n, number of patients

Table 3. Distribution of surgical patients by postoperative complications.

Postoperative complication	Frequency	
	Number of complications	%
Only unilateral pre-auricular epidermolysis	2	6.3%
Few organized unilateral hematoma	4	12.5%
Organized hematoma and epidermolysis concomitant and unilateral	4	12.5%

of postoperative patients indicated increased edema, peripheral lymphohistiocytic inflammatory activity, and severe epidermis hypotrophy; increased inflammatory activity and edema in all adipose tissue; and decreased fibrous collagen tissue thickness and presence of fibroconjunctive tissue with decreased vascularization in SMAS compared to non-post-bariatric patient skin.

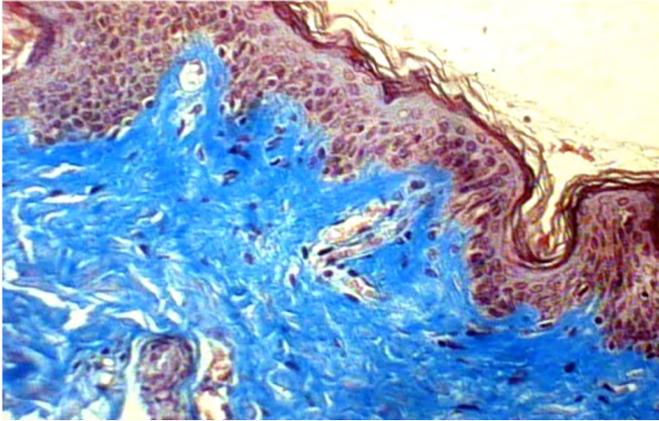


Figure 7. Normal skin. (Magnification: 200×. Stain: Masson's Trichrome.)

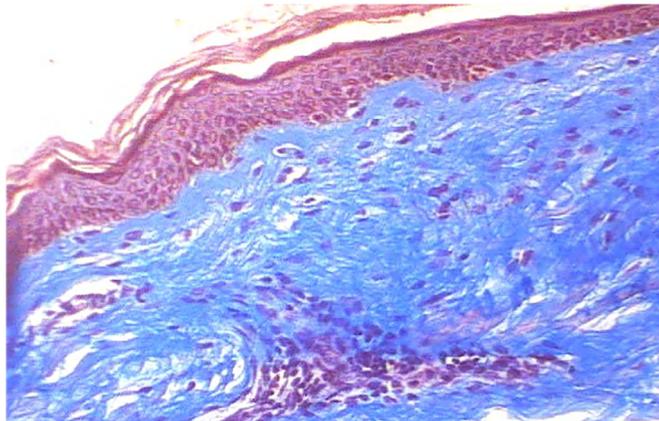


Figure 8. Post-bariatric skin. Diffuse edema and divulgation of collagen fibers are visible. (Magnification: 200×. Stain: Masson's Trichrome.)

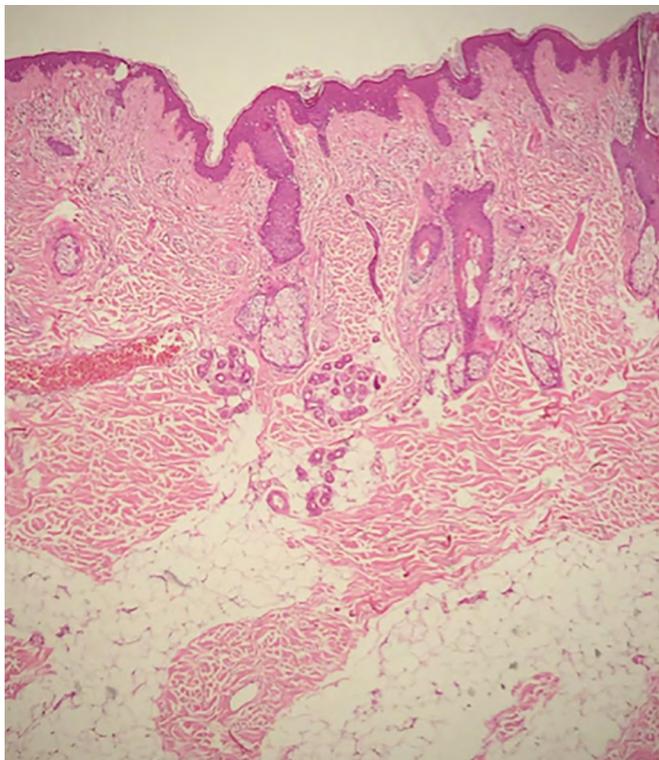


Figure 9. Normal skin. (Magnification: 100×. Stain: hematoxylin and eosin.)

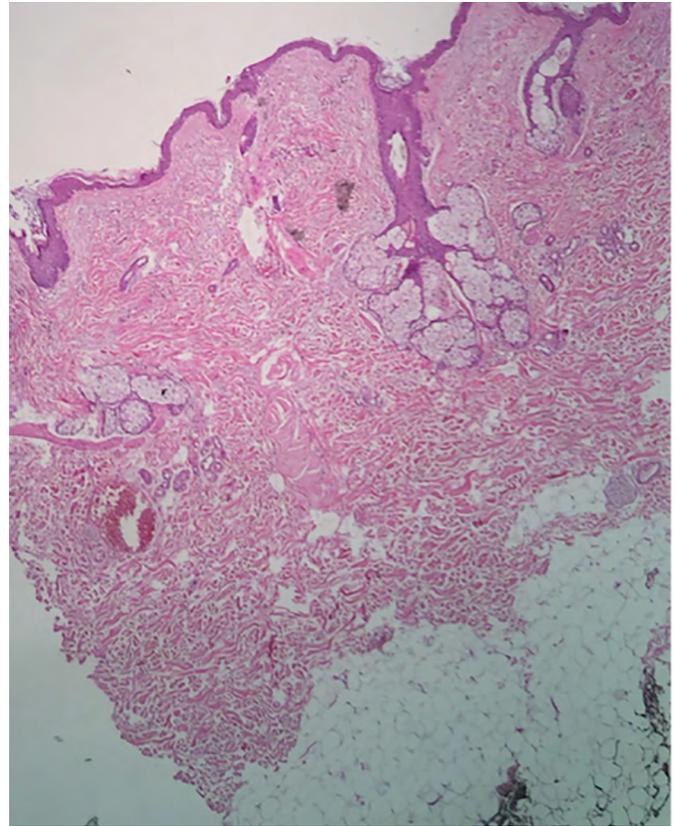


Figure 10. Post-bariatric skin. Peripheral lymphohistiocytic inflammatory activity and severe hypotrophy in the dermal thickness are visible. (Magnification: 100×. Stain: hematoxylin and eosin.)

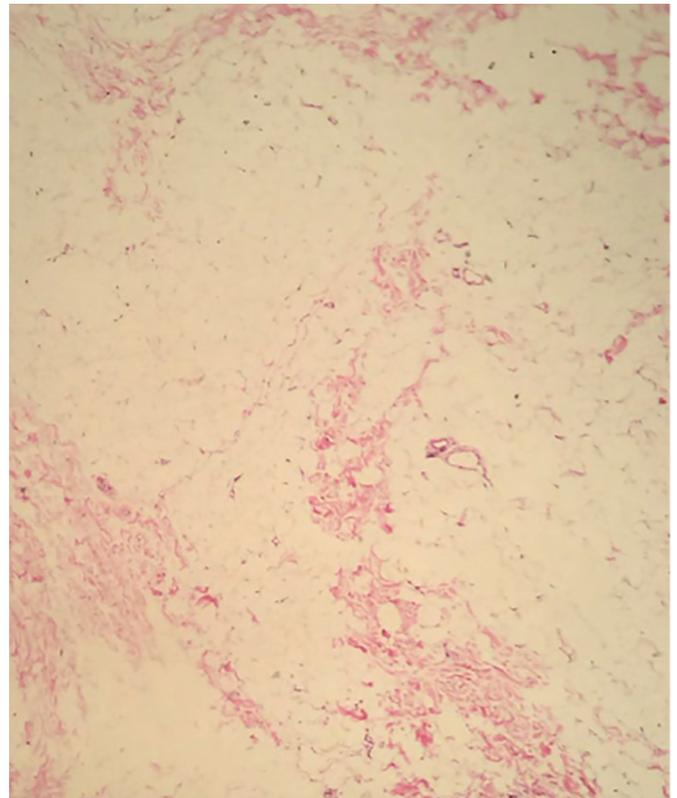


Figure 11. Normal adipose tissue. (Magnification: 100×. Stain: hematoxylin and eosin.)

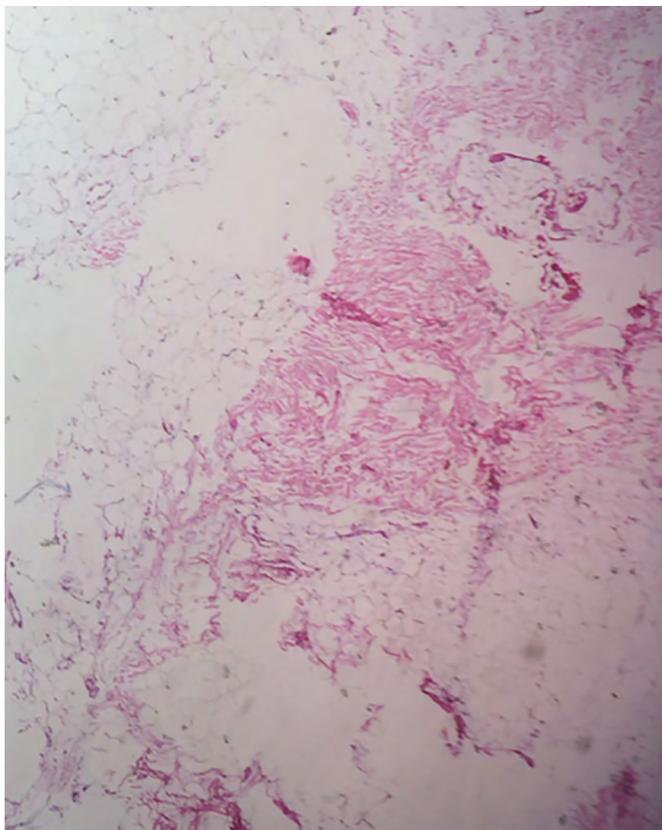


Figure 12. Post-bariatric adipose tissue. Inflammatory activity and edema are evident. (Magnification: 100×. Stain: hematoxylin and eosin.)

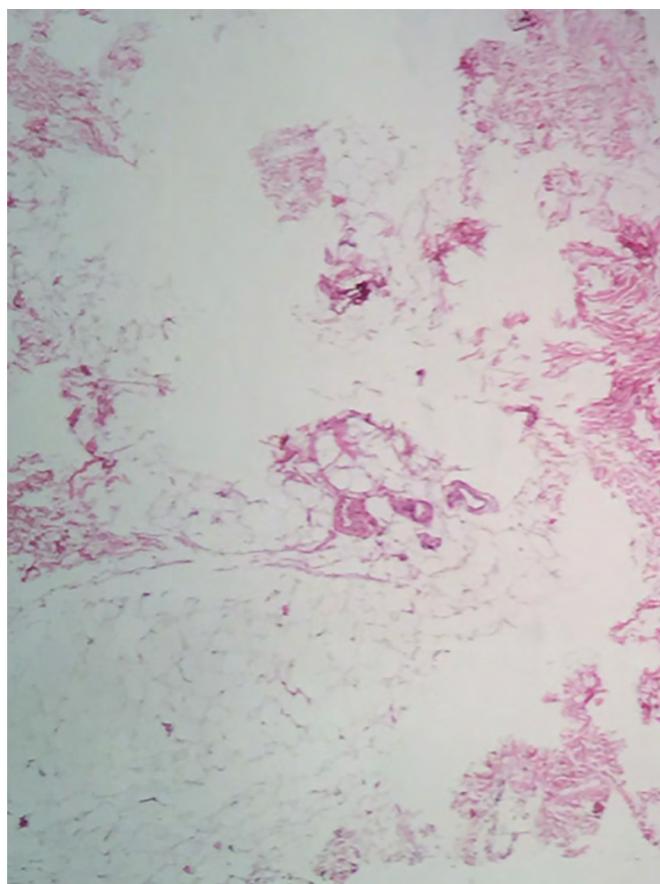


Figure 14. Post-bariatric superficial musculoaponeurotic system. Presence of decreased fibrous collagen tissue in its thickness and fibroconjunctive tissue with decreased vascularization. (Magnification: 100×. Stain: hematoxylin and eosin.)

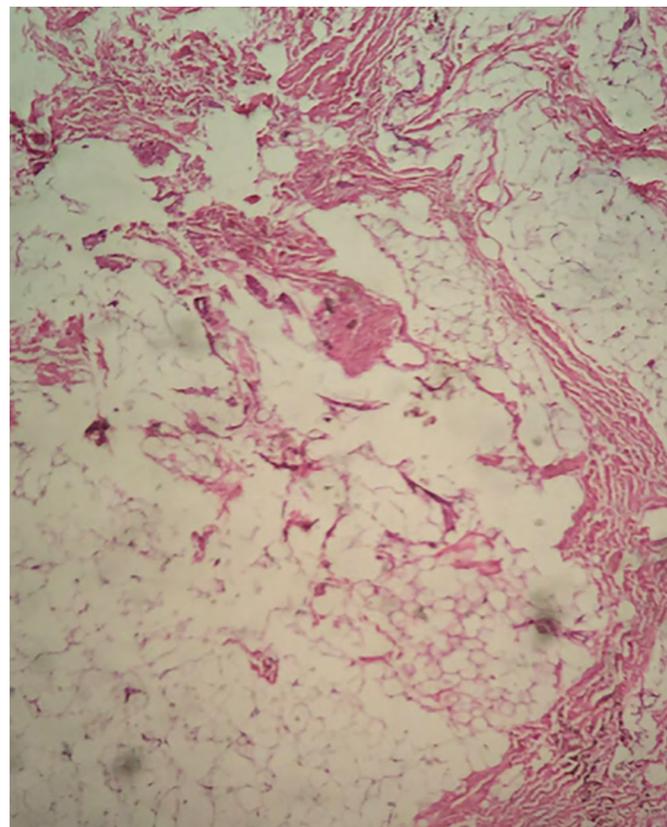


Figure 13. Normal superficial musculoaponeurotic system. (Magnification, 100×. Stain: hematoxylin and eosin.)

DISCUSSION

Bariatric surgery has emerged as an effective and rapid possibility of weight control in obese patients who seek to improve their health status along the lines recommended by the World Health Organization, not only disease absence (hypertension, coronary disease, pulmonary hypertension, diabetes, dyslipidemias, gastroesophageal reflux disease, skin mycoses, etc.)^{7,12}, but their complete physical, mental, and social well-being.

Plastic surgery plays a crucial role in healthy outcomes, promoting surgeries that, roughly speaking, could even be called inclusion procedures since the patient whose face was quickly transformed by weight loss can have his facial pattern restored. Because the face is an area that the patient cannot camouflage using clothing, the surgical procedure allows the patient to feel like the individual that he or she was before, to better accept themselves and be better accepted by society.

Rhytidoplasty is indicated for patients after MWL, when they achieve weight stability. The greatest weight loss usually occurs at about 12–18 months after bariatric surgery, and it is prudent to wait about

4–6 months after that to assess whether the plateau is maintained¹³. However, in our service, although we always wait for weight stability, it was not always necessary to wait for a 45-kg loss (or 50% of the initial weight, defined as massive weight loss) since many patients already complained and presented good surgical indications even before that. These patients presented satisfactory postoperative surgical results in relation to the initial flaccidity, with frank rejuvenation and restructuring of the face and neck esthetic pattern.

Knowledge about facial changes resulting from aging is better established than that involving changes in facial skin structure and histology resulting from MWL; however, this group shows turgor decreases and losses of subcutaneous fat^{14,15}. Skin thickness tends to decrease in the facial region^{12,15} despite signs of increased or no difference in thickness in other regions¹². Additionally, there is an increase in the expression of collagen type III, an immature collagen with lower healing capacity^{12,16,17}; fibers become fewer and wider in number^{12,17,18}; besides histological changes compatible with aging, such as loss of collagen fiber cohesion and enzymatic degradation of loose tissue^{12,14,15,17,19}.

It is not uncommon for post-bariatric patients to experience nutritional changes. The literature suggests the use of nutritional supplementation to prevent or treat nutritional deficiencies resulting from anatomical changes caused by surgical techniques^{8,20-28}.

The main complications associated with rhytidoplasty in post-MWL patients are hematomas and edemas, which usually disappear in about 2–3 weeks; paresthesia, with significant improvement by about 2–3 months postoperative; and rare reports of skin necrosis or paralysis of the mime muscles due to facial nerve injury, or even hypertrophic or keloid scars in the retroauricular zones², but the main complications in our study were small foci of organized preauricular hematoma in 25% of cases, followed by small areas of unilateral preauricular epidermolysis in 18.8% of cases. There are authors who do not perceive an influence of MWL on the increase of postoperative complications compared to control groups²⁹.

CONCLUSION

The surgical technique of rhytidoplasty in post-bariatric patients follows general principles except for specific details of this group of patients, such as the most aggressive plicature and treatment of the platysma muscle and the eventual need for SMASectomy. Patients in the study group presented skin of worse histological quality compared to those without the nutritional difficulties arising from weight reduction surgery. That is, postoperative bariatric skin presents a worse collagen fiber arrangement as well as exacerbation of

the local inflammatory reaction, which in theory hinders the healing process and procedure durability and increases the risk of local complications. Nevertheless, perioperative complications were not different than expected, even for patients who did not undergo bariatric surgery. Further studies are needed to establish conclusions regarding the procedure's durability.

COLLABORATIONS

- HLFG** Analysis and/or data interpretation, Conception and design study, Conceptualization, Data Curation, Final manuscript approval, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Resources, Supervision, Visualization, Writing - Original Draft Preparation, Writing - Review & Editing
- MGXPP** Analysis and/or data interpretation, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Visualization, Writing - Original Draft Preparation, Writing - Review & Editing
- DVS** Analysis and/or data interpretation, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Visualization, Writing - Original Draft Preparation, Writing - Review & Editing
- RKF** Analysis and/or data interpretation, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Visualization, Writing - Original Draft Preparation, Writing - Review & Editing
- RK** Analysis and/or data interpretation, Conception and design study, Conceptualization, Final manuscript approval, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Realization of operations and/or trials, Resources, Supervision, Validation, Visualization, Writing - Original Draft Preparation, Writing - Review & Editing

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