REVISTA INVECOM
ISSN en línea: 2739-0063

Development and evaluation of abdominoplasty in patients with morbid obesity: A systematic review

Desarrollo y evaluación de abdominoplastia en pacientes con obesidad mórbida: una revisión sistemática

Received: 24/04/2025 - **Accepted:** 28/08/2025

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Abstract

Morbid obesity is a chronic condition that carries high medical risks and significantly impairs patients' quality of life. Although bariatric surgery is effective in achieving sustained weight loss, it frequently results in excess abdominal skin, which is why abdominoplasty is often performed. This procedure goes beyond aesthetic improvement, as it resolves associated functional problems, such as skin infections, difficulties with personal hygiene, and mobility limitations. Abdominoplasty has undergone significant advances thanks to innovative surgical techniques, such as its combination with liposuction and optimized abdominal resection, which have improved both aesthetic results and postoperative recovery. However, it is important to note that patients with morbid obesity face additional risks during the surgical process due to concomitant comorbidities and a compromised immune system, which requires rigorous and careful perioperative management. This article is based on a descriptive and analytical methodology, based on a systematic review of the scientific literature published between 2010 and 2024. Twenty relevant studies addressing surgical techniques, perioperative management, and postoperative outcomes in this population were analyzed using sources such as PubMed and Scopus. The analysis shows that abdominoplasty, in addition to its aesthetic benefits, significantly contributes to functionality and improved quality of life for patients, although it requires thorough postoperative follow-up to minimize complications and ensure optimal results.

Keywords: abdominoplasty, obesity, risks.

Resumen

La obesidad mórbida es una condición crónica que conlleva elevados riesgos médicos y deteriora significativamente la calidad de vida de los pacientes. Aunque la cirugía bariátrica es eficaz para lograr una pérdida de peso sostenida, frecuentemente deja como secuela un exceso de piel abdominal, lo que motiva la realización de una abdominoplastia. Este procedimiento va más allá de la mejora estética, ya que soluciona problemas funcionales asociados, como infecciones cutáneas, dificultades en la higiene personal y limitaciones en la movilidad. La abdominoplastia ha experimentado avances importantes gracias a técnicas quirúrgicas

innovadoras, tales como la combinación con liposucción y la optimización en la resección abdominal, lo que ha permitido mejorar tanto los resultados estéticos como la recuperación postoperatoria. Sin embargo, es importante destacar que los pacientes con obesidad mórbida enfrentan riesgos adicionales durante el proceso quirúrgico debido a comorbilidades concomitantes y un sistema inmunológico comprometido, lo que exige un manejo perioperatorio riguroso y cuidadoso. Este artículo se fundamenta en una metodología descriptiva y analítica, basada en una revisión sistemática de la literatura científica publicada entre 2010 y 2024. Se analizaron 20 estudios relevantes que abordan técnicas quirúrgicas, manejo perioperatorio y resultados postoperatorios en esta población, utilizando fuentes como PubMed y Scopus. El análisis evidencia que la abdominoplastia, además de sus beneficios estéticos, contribuye de manera significativa a la funcionalidad y mejora de la calidad de vida de los pacientes, aunque requiere un seguimiento postoperatorio exhaustivo para minimizar complicaciones y asegurar resultados óptimos.

Palabras clave: abdominoplastia, obesidad, riesgos.

Introduction

Morbid obesity is a chronic, multifactorial condition that affects millions of people worldwide and is characterized by a body mass index (BMI) of 40 kg/m² or higher (Kaufer-Horwitz & Pérez, 2021). This disease poses a significant risk of medical complications, including cardiovascular diseases, type 2 diabetes, hypertension, obstructive sleep apnea, and osteoarthritis. Moreover, its impact on the musculoskeletal and metabolic systems significantly compromises the physical functionality of patients, thereby limiting their quality of life and increasing associated morbidity (Minetto et al., 2020).

Among the available therapeutic options, bariatric surgery has proven to be an effective tool for achieving significant and sustained weight loss in this patient population. However, a common consequence of such interventions is excess abdominal skin, a challenge that presents both functional and aesthetic clinical issues.

In this context, abdominoplasty, also known as abdominal lipectomy, emerges as a surgical solution to correct excess skin and adipose tissue in the abdominal region. From a medical perspective, this procedure aims not only to improve bodily appearance but also to address important functional problems (Ballestas-Campo & Pomerane, 2014). These issues include chronic skin infections such as intertrigo, dermal irritations, difficulties in personal hygiene, and mobility limitations stemming from redundant skin tissue. By alleviating these difficulties, abdominoplasty can lead to a significant improvement in physical functionality and overall well-being of the patient, thus underscoring its role in the comprehensive management of morbid obesity (Muñoz et al., 2010).

In recent years, advancements in surgical techniques have optimized the outcomes of abdominoplasty in patients with morbid obesity. These improvements include safer methods for managing redundant tissue, suturing techniques that reduce the risk of healing complications, and comprehensive approaches that consider the comorbidities inherent to these patients. However, the physiological particularities of morbid obesity present an additional challenge. Factors such as increased adipose tissue volume, metabolic alterations—like insulin resistance—and a compromised immune system elevate the risk of postoperative complications, including infections, wound dehiscence, and seromas. Furthermore, the frequent presence of coexisting comorbidities, such as hypertension and sleep apnea, necessitates careful management throughout the perioperative period.

Technical developments in abdominoplasty for this group have fostered the adoption of tailored surgical strategies. Notable among these is the anchor abdominoplasty, which allows for greater tissue resection in multiple directions, as well as the integration of less invasive techniques that minimize surgical trauma and facilitate faster recovery (Vidal et al., 2017). Additionally, perioperative management is critical to ensuring procedural safety. Preoperative preparation involves a thorough assessment of comorbidities, rigorous control of metabolic parameters, and detailed planning of anesthetic management. In the postoperative phase, close monitoring is essential to promptly identify and address any complications.

Another crucial aspect in the medical evaluation of abdominoplasty is its contribution to the improvement of physical function. Clinical studies indicate that following the intervention, patients experience a significant reduction in mobility issues and recurrent infections (Mendieta & Minchala, 2018). This translates into an enhanced capacity to perform daily activities and a notable advancement in quality of life from a functional perspective. Nevertheless, it is imperative to recognize that abdominoplasty in patients with morbid obesity carries inherent risks that must be weighed against the expected benefits. The appropriate selection of candidates, based on rigorous medical criteria, is a key factor in ensuring the success of the procedure (Amezquita et al., 2020).

In view of these considerations, the present article focuses on analyzing the development and evaluation of abdominoplasty in patients with morbid obesity from a medical perspective. Specifically, it addresses two fundamental variables: surgical techniques and postoperative functional outcomes. Regarding surgical

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techniques, current strategies to optimize tissue management and reduce complications will be explored. Regarding functional outcomes, changes observed in mobility, complication rates, and overall patient functionality following the procedure will be examined.

Methodology

This study aims to provide an updated overview of the role of abdominoplasty in the comprehensive management of patients with morbid obesity through an extensive review of the medical literature and analysis of clinical cases (Hernández et al., 2014). Complementarily, it seeks to identify best practices for its application, encompassing preoperative preparation, the most effective surgical techniques, and postoperative follow-up. Thus, the goal is to contribute a solid foundation for clinical decision-making and promote the development of safer and more effective surgical protocols in this context.

To achieve this, a descriptive and analytical approach was adopted, based on a systematic review of published scientific articles in international databases. The selection included studies focused on abdominoplasty in patients with morbid obesity, with particular emphasis on surgical techniques, perioperative management, and postoperative clinical outcomes (Medina et al., 2023).

To ensure the relevance and quality of the collected material, the following inclusion criteria were defined:

- **Type of studies**: Original studies, systematic reviews, and meta-analyses published between 2010 and 2024 were selected.
- **Interventions**: Articles describing surgical techniques, perioperative management, and functional outcomes related to abdominoplasty were included.
- **Outcomes**: Research evaluating surgical complications, functional recovery, management of comorbidities, and clinical benefits of the procedure were considered.
- **Languages**: Publications in English and Spanish.

In contrast, the following were excluded:

- Studies conducted in pediatric populations or in patients without a diagnosis of morbid obesity.
- Articles with insufficient information or without complete access to the text.
- Duplicate studies found in different databases.

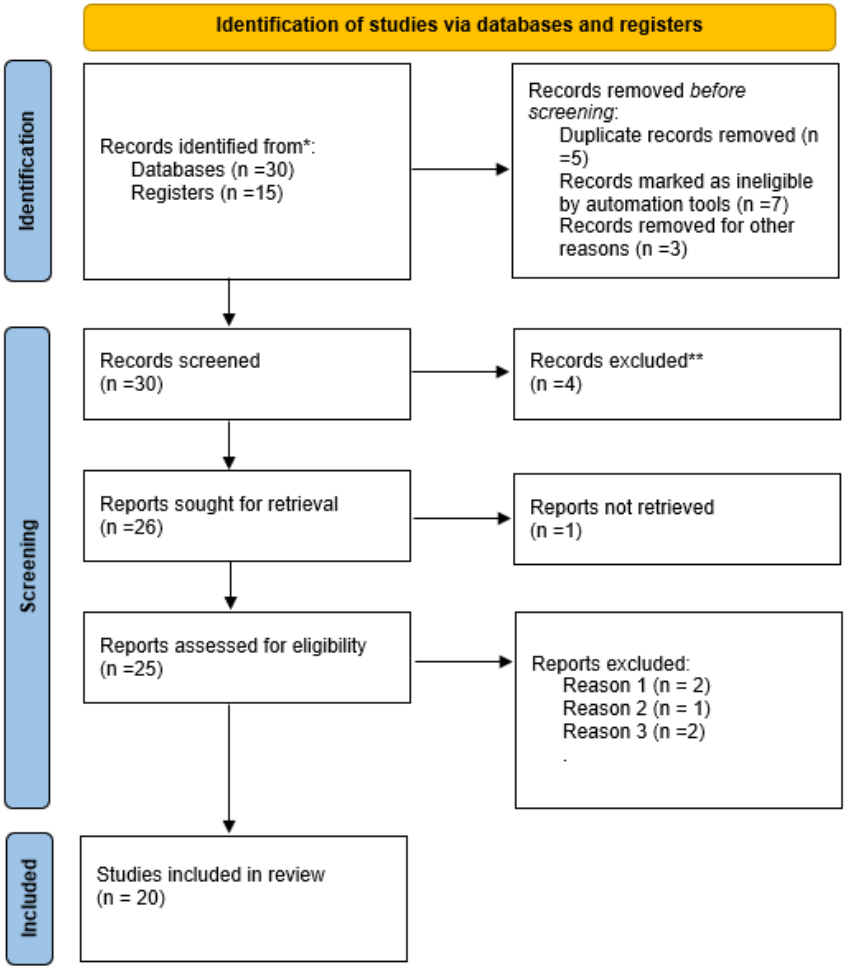
The search was conducted in high-impact scientific databases such as PubMed, Scopus, Web of Science, and Scielo, using combinations of keywords linked by Boolean operators, for example:

- ("*abdominoplasty*" *OR* "*abdominal lipectomy*") *AND* ("*morbid obesity*" *OR* "*obese patients*").
- ("*surgical techniques*" *OR* "*complications*") *AND* ("*bariatric surgery*" *OR* "*post-bariatric patients*").

Since this is a systematic review, ethical approval was not necessary, as no direct patient data or sensitive information was handled (Medina et al., 2023). However, methodological rigor and transparency in the selection and analysis of information were ensured.

In conclusion, this methodology guarantees a rigorous and evidence-based approach, offering a comprehensive perspective on the development and evaluation of abdominoplasty in patients with morbid obesity from a medical viewpoint.

Figure 1
PRISMA diagram



Results

Table 1
Results

No.	Author	Contribution
1	(Nazar et al., 2018)	The perioperative management of patients with morbid obesity requires a multidisciplinary and personalized approach that considers the anatomical and physiological particularities of this group. Optimizing the airway through techniques such as ramp positioning and precise dosing of anesthetics based on lean weight is crucial to reducing complications. Strict monitoring in the post-anesthesia recovery unit ensures patient safety, highlighting the importance of evidence-based protocols to improve surgical outcomes in this vulnerable population.

2	(Lomeli-Reyes et al., 2024)	Temporal challenges related to food quality and tolerance are identified, especially during the first three postoperative months, with subsequent progressive improvement. These findings underscore the need to implement comprehensive surgical programs and conduct long-term studies that evaluate both the evolution of comorbidities and sustained benefits in the quality of life of these patients.
3	(Murshid et al., 2010)	Abdominoplasty transcends mere aesthetic improvement of the abdominal contour, as it also offers relevant therapeutic benefits. This procedure can prevent and alleviate back pain, improve physical activity, sexual life, and strengthen partner relationships. Additionally, its positive impact on the elimination of fungal infections underscores its contribution to overall well-being, establishing it as a comprehensive intervention that combines functional and aesthetic outcomes.
4	(Cuomo et al., 2024)	Managing patients with morbid obesity undergoing abdominoplasty requires special attention due to the direct relationship between an elevated BMI and increased risk of postoperative complications. Therefore, implementing standardized surgical protocols is essential to optimize results and minimize risks. Future research could provide further evidence on this correlation, enhancing the safety and efficacy of the procedure in this population.
5	(Sadeghi et al., 2022)	Post-bariatric plastic surgery faces unique challenges arising from the complex conditions of the patient, such as excess skin and the effects of poorly absorbed bariatric surgery, which increase the risk of complications. However, scientific and technological advancements promise to transform these interventions through personalized techniques that not only decrease the incidence of seromas and hemorrhages but also accelerate recovery and reintegration into daily and work life, improving quality of life.
6	(Zhou et al., 2020)	Lipoabdominoplasty presents as an innovative technique that combines aspects of abdominoplasty and liposuction, optimizing the reduction of postoperative complications. By employing selective detachment that preserves blood supply and abdominal lymphatic vessels, this technique offers significant advantages in safety and recovery. Although isolated liposuction typically involves less pain and shorter recovery times, lipoabdominoplasty constitutes a balanced alternative for patients requiring a more comprehensive body intervention.
7	(Suazo et al., 2022)	Post-bariatric abdominoplasty should not be considered a minor surgery, as it involves the resection of significant amounts of tissue. It is often combined with other procedures, such as liposuction and mastopexy, as part of an integrated plan aimed at the reconstruction and harmonization of the patient's body silhouette.
8	(Frigolet et al., 2020)	A thorough study of adipose tissue and its remodeling is fundamental to understanding the metabolic effects of obesity and the influence of surgical interventions, such as bariatric surgery, on these processes. In the context of abdominoplasty in patients with morbid obesity, it is essential to analyze how induced weight loss affects adipose tissue distribution and impacts aesthetic and functional outcomes of the surgery.
9	(Suárez et al., 2017)	Although a global increase in body fat is associated with health risks, it is particularly visceral abdominal fat that is related to higher morbidity and mortality. Therefore, it is necessary to promote preventive strategies and therapeutic alternatives to existing options, as well as to push institutional and educational efforts that encourage healthy eating habits and effective physical exercise programs.
10	(Añez et al., 2022)	Obesity, being a risk factor for postoperative complications, demands more careful attention in aesthetic procedures such as abdominoplasty in this population. Common complications, such as infections and circulatory insufficiency, may be exacerbated due to immunological and circulatory alterations characteristic of obesity. Therefore, it is crucial to develop preventive strategies and tailored surgical protocols to reduce risks and improve outcomes, highlighting the need for in-depth research on surgical management specific to these patients.

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11	(Ramírez et al., 2021)	It is essential to apply a comprehensive approach that combines traditional surgical techniques with advanced technologies, such as ultrasound-assisted procedures. Personalization in surgery, considering adequate preservation of abdominal muscle, precise resection of skin and fat, and creation of natural contours, is key to achieving optimal aesthetic and functional results. This approach not only improves immediate outcomes but also favors their long-term sustainability, minimizing complications and enhancing postoperative quality of life.
12	(Samimi, 2021)	In patients with morbid obesity, the evolution of abdominoplasty techniques has allowed for more precise interventions adapted to the anatomical complexity of this population. The combination of liposuction with abdominoplasty, along with technological innovations such as progressive tension sutures and laser-assisted liposuction, has significantly improved outcomes by reducing complications and enhancing skin tension. These innovations allow for more accurate body sculpting, which not only perfects physical appearance but also fosters self-esteem and quality of life.
13	(Goulart & Onida, 2011)	The block resection technique proposed by Pontes, after 18 years of application, has proven to be safe and effective in abdominoplasties, particularly in patients with morbid obesity. Its ability to preserve the natural anatomy of the abdomen, respecting the superficial structure without generating artificial shapes, is fundamental to maintaining a harmonious appearance. Additionally, this technique is associated with low complication rates and allows for agile execution, combining safety and satisfactory aesthetic results, in line with a philosophy of respect for anatomy and avoiding fleeting trends.
14	(García-García et al., 2014)	Postoperative complications after abdominoplasty in patients with morbid obesity are relatively frequent and can extend hospital stays and outpatient controls. Although our study did not identify specific risk factors, it is essential to provide the patient with clear and adequate information to manage their expectations. While these complications may lead to dissatisfaction, the aesthetic outcome is not usually the main cause of discontent.
15	(Altamirano et al., 2021)	The growing obesity pandemic has increased the demand for aesthetic procedures such as abdominoplasty, especially in patients post-bariatric surgery. However, it is imperative to consider that, in addition to the common risks associated with any surgery, these patients have a higher likelihood of postoperative complications. The body mass index (BMI) is recognized as an important predictor of complications such as infections, prolonged hospital stays, reoperations, and mortality. Therefore, a thorough preoperative assessment that includes BMI and other risk factors is necessary to adequately evaluate the risk-benefit relationship.
16	(Zambrano et al., 2020)	Although abdominoplasty is a common aesthetic procedure in patients with a history of morbid obesity, it involves significant risks of postoperative complications, such as infections, seromas, necrosis, hernias, and loss of sensation. These risks are heightened in obese patients, especially when surgery is combined with other procedures.
17	(Restifo, 2021)	In the context of abdominoplasty in patients with morbid obesity, a history of post-bariatric weight loss constitutes an independent risk factor for complications, necessitating a cautious approach. Although aesthetic expectations are often high in these patients, it is a priority to balance safety with achieving satisfactory results. In cases of patients with a lower BMI and no severe comorbidities, it is possible to optimize aesthetic goals without increasing the risk of severe complications. Continuous review of techniques, avoiding unnatural results and seeking harmony, is essential to enhance satisfaction and quality of life.
18	(Mendonça et al., 2019)	Abdominoplasty in patients with morbid obesity who have experienced significant weight loss proves to be a safe and effective technique for correcting excess abdominal skin, significantly improving body contour. This intervention impacts not only from an aesthetic perspective but also improves quality of life by eliminating associated complications such as dermal irritations and limitations in physical activity.

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19	(Hunecke et al., 2019)	Although severe systemic complications are infrequent, patients with preexisting conditions such as type 2 diabetes and cardiovascular issues face a higher risk of postoperative complications. Therefore, it is essential to conduct a thorough preoperative evaluation to identify these factors and optimize safety, adapting surgical strategies and postoperative management to individual characteristics.
20	(Drygalski et al., 2025)	Although abdominoplasty provides psychological benefits, particularly in reducing anxiety and depressive symptoms, it does not show significant improvements in body perception, self-esteem, or sexual function beyond the effects achieved with bariatric surgery. These findings highlight the importance of establishing realistic expectations in patients regarding the benefits of body contouring procedures following bariatric surgery.

Discussion

The approach to abdominoplasty in patients with morbid obesity has evolved toward a comprehensive strategy that seeks to balance aesthetic benefits with procedural safety. In this regard, Nazar et al. (2018) emphasize that the anatomical and physiological complexity of this population requires meticulous preoperative preparation, including airway optimization and personalized dosing of anesthetics—key aspects for reducing surgical risks. This perspective aligns with Añez et al. (2022), who highlight that obesity increases the likelihood of complications such as infections and circulatory insufficiencies, making it imperative to implement surgical protocols tailored to each patient's specific profile.

Furthermore, the literature underscores body mass index (BMI) as a fundamental predictor of complications. Altamirano et al. (2021) indicate that a high BMI is associated with greater incidence of infections, prolonged hospital stays, and higher rates of reoperation, necessitating thorough preoperative evaluation to determine the suitability of abdominoplasty. In agreement, Cuomo et al. (2024) stress the importance of standardizing protocols to improve outcomes, given the direct and significant relationship between BMI and postoperative risk.

On the other hand, technical advancements have enabled the development of safer and more personalized solutions. Samimi (2021) and Zhou et al. (2020) highlight that the introduction of innovative techniques, such as lipoabdominoplasty and progressive tension sutures, contributes to optimizing aesthetic results, reducing complications, and accelerating recovery. These advancements demonstrate that surgery extends beyond merely aesthetic purposes, providing relevant functional benefits, as noted by Murshid et al. (2010), who emphasize improvements in back pain, physical activity, and sexual life.

Regarding quality of life, Mendonça et al. (2019) and Drygalski et al. (2025) present a nuanced view: while abdominoplasty facilitates the removal of excess skin and improves physical comfort, the psychological benefits do not always exceed those achieved after bariatric surgery, highlighting the need to appropriately manage patient expectations.

Conclusions

In summary, abdominoplasty in patients with morbid obesity has undergone significant advancements, integrating technical innovations and a personalized approach that enhances both aesthetic and functional outcomes. Modern surgical techniques, such as the combination of liposuction with abdominoplasty, the block resection technique by Pontes, and lipoabdominoplasty, have increased the precision of interventions and reduced postoperative complications. These improvements not only facilitate more effective management of excess skin and adipose tissue but also substantially contribute to enhancing patients' quality of life by alleviating musculoskeletal pain and promoting better mobility.

Moreover, the application of standardized surgical protocols and a multidisciplinary approach, which considers factors such as BMI and associated comorbidities, is essential for ensuring safety and optimizing long-term outcomes. Additionally, postoperative follow-up in this population requires careful monitoring to detect potential complications, such as infections and seromas, which have a higher incidence in patients with morbid obesity. Nonetheless, the therapeutic benefits derived from abdominoplasty—such as improved daily functionality and resolution of dermatological issues—clearly outweigh the associated risks. As surgical techniques continue to be refined and more effective strategies for postoperative management are implemented, abdominoplasty reaffirms itself as a comprehensive and valuable option in the treatment of morbid obesity, encompassing not only aesthetic aspects but also functional and overall well-being.

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