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PREANESTHETIC EVALUATION IN ABDOMINAL PLASTIC SURGERY: A SYSTEMATIC REVIEW OF CLINICAL PRACTICE

AVALIAÇÃO PRÉ-ANESTÉSICA EM CIRURGIA PLÁSTICA ABDOMINAL: UMA REVISÃO SISTEMÁTICA DA PRÁTICA CLÍNICA

EVALUACIÓN PREANESTÉSICA EN CIRUGÍA PLÁSTICA ABDOMINAL: UNA REVISIÓN SISTEMÁTICA DE LA PRÁCTICA CLÍNICA

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ABSTRACT

Introduction: Abdominal plastic surgery is associated with relevant physiological stress, heterogeneous patient profiles, and a non-negligible risk of perioperative complications, making structured preanesthetic evaluation a cornerstone of patient safety.

Objective: The main objective was to systematically review current evidence on preanesthetic evaluation in abdominal plastic surgery, with secondary objectives addressing risk stratification, cardiopulmonary assessment, thromboembolic prevention, metabolic optimization, and the role of multidisciplinary planning.

Methods: A systematic search was conducted in PubMed, Scopus, Web of Science, Cochrane Library, LILACS, ClinicalTrials.gov, and ICTRP, including studies published within the last five years, with predefined eligibility criteria and structured qualitative synthesis.

Results and Discussion: Twenty studies were included, demonstrating consistent associations between comprehensive preanesthetic assessment and reduced perioperative complications, improved patient selection, and optimized surgical outcomes, although heterogeneity in protocols and evidence certainty was observed.

Conclusion: Evidence supports standardized, individualized, and multidisciplinary preanesthetic evaluation as a critical component of safe abdominal plastic surgery practice.

Keywords: Preoperative Care. Anesthesia Evaluation. Abdominoplasty. Patient Safety.

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RESUMO

Introdução: A cirurgia plástica abdominal está associada a estresse fisiológico relevante, perfis heterogêneos de pacientes e um risco não negligenciável de complicações perioperatórias, tornando a avaliação pré-anestésica estruturada um pilar fundamental da segurança do paciente.

Objetivo: O objetivo principal foi revisar sistematicamente as evidências atuais sobre a avaliação pré-anestésica em cirurgia plástica abdominal, com objetivos secundários voltados à estratificação de risco, avaliação cardiopulmonar, prevenção tromboembólica, otimização metabólica e o papel do planejamento multidisciplinar.

Métodos: Foi realizada uma busca sistemática nas bases de dados PubMed, Scopus, Web of Science, Cochrane Library, LILACS, ClinicalTrials.gov e ICTRP, incluindo estudos publicados nos últimos cinco anos, com critérios de elegibilidade predefinidos e síntese qualitativa estruturada.

Resultados e Discussão: Vinte estudos foram incluídos, demonstrando associações consistentes entre avaliações pré-anestésicas abrangentes e redução de complicações perioperatórias, melhor seleção de pacientes e otimização dos desfechos cirúrgicos, embora tenha sido observada heterogeneidade nos protocolos e na certeza das evidências.

Conclusão: As evidências sustentam a avaliação pré-anestésica padronizada, individualizada e multidisciplinar como componente crítico para a prática segura da cirurgia plástica abdominal.

Palavras-chave: Cuidados Pré-operatórios. Avaliação Anestésica. Abdominoplastia. Segurança do Paciente.

RESUMEN

Introducción: La cirugía plástica abdominal se asocia con un estrés fisiológico relevante, perfiles heterogéneos de pacientes y un riesgo no despreciable de complicaciones perioperatorias, lo que convierte a la evaluación preanestésica estructurada en un pilar fundamental de la seguridad del paciente.

Objetivo: El objetivo principal fue revisar sistemáticamente la evidencia actual sobre la evaluación preanestésica en cirugía plástica abdominal, con objetivos secundarios orientados a la estratificación del riesgo, la evaluación cardiopulmonar, la prevención tromboembólica, la optimización metabólica y el papel de la planificación multidisciplinaria.

Métodos: Se realizó una búsqueda sistemática en las bases de datos PubMed, Scopus, Web of Science, Cochrane Library, LILACS, ClinicalTrials.gov e ICTRP, incluyendo estudios publicados en los últimos cinco años, con criterios de elegibilidad predefinidos y una síntesis cualitativa estructurada.

Resultados y Discusión: Se incluyeron veinte estudios, que demostraron asociaciones consistentes entre evaluaciones preanestésicas integrales y la reducción de complicaciones perioperatorias, una mejor selección de pacientes y la optimización de los resultados quirúrgicos, aunque se observó heterogeneidad en los protocolos y en la certeza de la evidencia.

Conclusión: La evidencia respalda la evaluación preanestésica estandarizada, individualizada y multidisciplinaria como un componente crítico de la práctica segura de la cirugía plástica abdominal.

Palabras clave: Atención Preoperatoria. Evaluación Anestésica. Abdominoplastia. Seguridad del Paciente.

1 INTRODUCTION

Abdominal plastic surgery has experienced a significant increase worldwide, driven by aesthetic demand, post-bariatric body contouring, and advances in surgical techniques that broaden patient eligibility.[1] This expansion has resulted in a progressively heterogeneous patient population, including individuals with obesity, metabolic syndrome, prior abdominal surgeries, and multiple comorbidities.[1] Such complexity places substantial demands on perioperative management, particularly on anesthetic planning and risk stratification.[1]

Preanesthetic evaluation represents a structured process aimed at identifying clinical risks, optimizing physiological status, and planning perioperative strategies tailored to individual patients.[2] In abdominal plastic surgery, this evaluation must address not only general anesthetic risks but also procedure-specific factors such as surgical duration, fluid shifts, and postoperative pain management.[2] Failure to adequately assess these elements has been associated with increased rates of respiratory, cardiovascular, and thromboembolic complications.[2]

Cardiovascular risk assessment is a central component of preanesthetic evaluation, given the frequent presence of hypertension, dyslipidemia, and insulin resistance in candidates for abdominal contouring procedures.[3] Functional capacity assessment and targeted testing allow for identification of patients at increased risk of perioperative cardiac events.[3] Evidence suggests that individualized cardiovascular stratification contributes to safer anesthetic conduct and improved outcomes.[3]

Respiratory evaluation is particularly relevant in abdominal plastic surgery due to the impact of abdominal wall manipulation on diaphragmatic mechanics and postoperative ventilation.[4] Patients with obesity or obstructive sleep apnea are especially vulnerable to perioperative hypoventilation and airway complications.[4] Preoperative identification of respiratory risk factors enables tailored anesthetic techniques and postoperative monitoring strategies.[4]

Thromboembolic events remain among the most serious complications associated with abdominal plastic surgery, often influenced by patient-specific and procedure-related factors.[5] Preanesthetic assessment plays a key role in identifying thrombosis risk and coordinating pharmacological and mechanical prophylaxis.[5] Integrated evaluation models have been associated with reduced incidence of deep vein thrombosis and pulmonary embolism.[5]

Metabolic and nutritional status also influence perioperative risk, particularly in post-bariatric patients undergoing body contouring procedures.[6]

Alterations in glucose homeostasis, micronutrient deficiencies, and anemia may significantly affect anesthetic management and wound healing.[6] Systematic preanesthetic screening allows for correction or mitigation of these factors before surgery.[6]

Beyond physiological assessment, preanesthetic evaluation contributes to patient education, expectation alignment, and informed consent.[7] Clear communication regarding anesthetic risks, postoperative recovery, and pain control enhances patient cooperation and satisfaction.[7] This comprehensive approach aligns with modern principles of patient-centered and safety-oriented surgical care.[7]

Despite its recognized importance, preanesthetic evaluation practices in abdominal plastic surgery remain heterogeneous across institutions and regions.[8] Variability exists regarding assessment protocols, use of complementary tests, and integration with surgical decision-making.[8] This heterogeneity underscores the need for systematic synthesis of current evidence to inform standardized clinical practice.[8]

The present systematic review aims to critically evaluate contemporary literature on preanesthetic evaluation in abdominal plastic surgery.[9] By synthesizing available evidence, it seeks to clarify best practices, identify gaps in knowledge, and support evidence-based perioperative management.[9] Such analysis is essential to enhance patient safety and optimize outcomes in this growing surgical field.[9]

2 OBJECTIVES

The main objective of this systematic review was to critically analyze current evidence on preanesthetic evaluation in patients undergoing abdominal plastic surgery, focusing on its role in perioperative risk reduction and optimization of surgical outcomes. Secondary objectives were to evaluate the methods used for cardiovascular risk stratification in this population, to assess the relevance of respiratory evaluation and sleep-disordered breathing screening, to examine strategies for thromboembolic risk assessment and prophylaxis, to analyze the impact of metabolic and nutritional optimization on anesthetic safety, and to explore the contribution of multidisciplinary planning between anesthesiologists, surgeons, and other specialists in improving perioperative care.

3 METHODOLOGY

A systematic literature search was conducted in PubMed, Scopus, Web of Science, Cochrane Library, LILACS, ClinicalTrials.gov, and the International Clinical Trials Registry

Platform (ICTRP), covering studies published within the last five years. The search strategy combined controlled vocabulary and free-text terms related to preanesthetic evaluation, preoperative assessment, anesthesia risk, and abdominal plastic surgery, including abdominoplasty and body contouring procedures. Reference lists of included studies were manually screened to identify additional relevant publications.

Eligible studies included randomized controlled trials, cohort studies, case-control studies, and prospective or retrospective observational studies that addressed preanesthetic evaluation or structured preoperative assessment in adult patients undergoing abdominal plastic surgery. Studies published within the last five years were prioritized, with an extension up to ten years permitted if fewer than ten eligible studies were identified. Human studies were prioritized, while animal or in vitro studies were considered only for contextual discussion and were planned to be presented separately if included. No language restrictions were applied, and studies with small sample sizes were accepted but explicitly considered as a limitation.

Study selection was performed independently by two reviewers through title and abstract screening, followed by full-text evaluation of potentially eligible articles. Disagreements were resolved by consensus or by consultation with a third reviewer. Data extraction was conducted independently and in duplicate using a standardized form, collecting information on study design, population characteristics, type of preanesthetic evaluation, assessed outcomes, and main conclusions. The study selection process was designed to comply with PRISMA recommendations and was documented using a structured flow diagram.

Risk of bias was assessed according to study design using the revised Cochrane Risk of Bias tool for randomized trials (RoB 2), the Risk Of Bias In Non-randomized Studies of Interventions tool (ROBINS-I), and the Quality Assessment of Diagnostic Accuracy Studies tool (QUADAS-2) when applicable. The certainty of evidence for each outcome was evaluated using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) framework, considering risk of bias, inconsistency, indirectness, imprecision, and publication bias.

This systematic review was justified by the increasing volume of abdominal plastic surgery procedures and the absence of consolidated, evidence-based guidelines specifically addressing preanesthetic evaluation in this context. The methodology was designed to ensure transparency, reproducibility, and methodological rigor, fully adhering to PRISMA standards for systematic reviews.

4 RESULTS

Table 1

Studies included in the systematic review on preanesthetic evaluation and perioperative risk management in abdominal plastic surgery, ordered chronologically

Reference	Population / Intervention / Comparison	Outcomes	Main conclusions
Harris L et al., 2020	Patients undergoing abdominoplasty managed under an Enhanced Recovery After Surgery pathway incorporating structured perioperative assessment	Postoperative recovery metrics, complication rates, analgesic requirements	Standardized perioperative pathways highlighted the importance of preanesthetic optimization, medication review, and analgesia planning to improve recovery and safety.
De Paep K et al., 2021	Post-bariatric patients undergoing abdominoplasty within a standardized surgical program	Overall complications, wound complications, predictive risk factors	Complications were associated with metabolic status and surgical magnitude, reinforcing the role of comprehensive preanesthetic evaluation focusing on nutrition and comorbidity control.
Schlosshauer T et al., 2021	Post-bariatric patients undergoing abdominoplasty analyzed for baseline risk predictors	Global complication rates, association with patient-related variables	Age, body mass index, and resection weight influenced outcomes, supporting individualized preanesthetic risk stratification.
Makarawung DJS et al., 2022	Post-bariatric body contouring patients undergoing nutritional optimization prior to surgery	Wound complications, perioperative morbidity	Preoperative nutritional assessment and correction reduced complications, emphasizing nutrition as a core element of preanesthetic evaluation.
Swanson E et al., 2022	Abdominoplasty patients evaluated for venous thromboembolism risk using structured assessment models	Thromboembolic risk, safety outcomes	Systematic thromboembolic risk assessment was essential for guiding prophylaxis and reducing perioperative morbidity.
Lombana NF et al., 2023	Abdominoplasty patients managed within enhanced recovery protocols	Pain control, opioid use, length of stay	Preanesthetic planning of multimodal analgesia contributed to improved

Reference	Population / Intervention / Comparison	Outcomes	Main conclusions
			recovery and reduced opioid exposure.
Saldanha O et al., 2023	Plastic surgery patients assessed for predictors of postoperative complications	Complication rates, modifiable risk factors	Identification of preoperative anemia, smoking, and comorbidities supported targeted optimization during anesthetic evaluation.
Akiska YM et al., 2023	Patients undergoing combined abdominoplasty and hernia repair	Medical and surgical complications	Procedure complexity increased risk, underscoring the importance of preanesthetic triage and perioperative planning.
Humar P et al., 2024	Massive weight loss patients prepared for abdominal body contouring surgery	Perioperative complications, safety outcomes	Comprehensive preoperative preparation, including anesthetic assessment, improved safety in high-risk patients.
Uhlman K et al., 2024	Systematic evaluation of enhanced recovery protocols in plastic surgery	Methodological quality, outcome reporting	Heterogeneity in protocols emphasized the need for standardized preanesthetic pathways.
Shauly O et al., 2024	Abdominoplasty patients receiving multimodal pain management strategies	Pain scores, opioid consumption	Preoperative anesthetic planning of pain control strategies improved postoperative comfort and reduced opioid requirements.
Chaker SC et al., 2024	Patients undergoing different types of abdominoplasty	Complication rates, procedure-specific risks	Surgical technique influenced perioperative risk, requiring tailored preanesthetic evaluation based on procedure type.
Zhou T et al., 2024	Selected abdominoplasty patients undergoing surgery without general anesthesia	Safety outcomes, recovery parameters	Alternative anesthetic techniques were feasible in selected patients following careful preanesthetic selection.
Stumpfe MC et al., 2024	Post-bariatric body contouring patients assessed using laboratory markers	Wound complications, seroma formation	Laboratory abnormalities identified during preanesthetic

Reference	Population / Intervention / Comparison	Outcomes	Main conclusions
			evaluation predicted postoperative complications.
Stein MJ et al., 2024	Abdominoplasty patients evaluated using structured safety protocols	Major complications, mortality	Standardized preanesthetic protocols were associated with improved perioperative safety.
Asiry A et al., 2025	Abdominoplasty patients stratified using thromboembolic risk scoring systems	Venous thromboembolism incidence	Risk-based preanesthetic stratification optimized prophylaxis and improved safety.
Wellenbrock S et al., 2025	Abdominoplasty patients receiving regional analgesia techniques	Pain control, length of hospital stay	Preoperative planning of regional anesthesia improved recovery and reduced opioid use.
Flores T et al., 2025	Post-bariatric versus non-bariatric patients undergoing abdominoplasty	Hemoglobin variation, blood loss	Post-bariatric status increased anemia risk, highlighting the need for preanesthetic hematologic optimization.
Barrera A et al., 2025	Abdominoplasty patients managed with different anesthetic techniques	Thromboembolic and recovery outcomes	Anesthetic technique selection influenced perioperative risk, reinforcing individualized anesthetic planning.
Tettamanzi M et al., 2025	Combined abdominal aesthetic procedures performed with regional or local anesthesia	Safety outcomes, feasibility	Rigorous preanesthetic selection enabled safe use of alternative anesthetic approaches in selected patients.

5 DISCUSSION

Preanesthetic evaluation in abdominal plastic surgery has evolved from a permissive “fitness for surgery” model into a structured risk-modification process focused on patient safety and outcome optimization.[10] The studies included in this review consistently demonstrate that abdominoplasty candidates frequently present with metabolic, cardiovascular, respiratory, and thromboembolic risk factors that directly influence anesthetic management.[10] This reinforces the concept that abdominal plastic surgery should be approached as a physiologically demanding procedure rather than a purely cosmetic intervention.[10]

One of the most consistent findings across the literature is the central role of cardiometabolic risk stratification during preanesthetic assessment.[11]

Obesity, hypertension, insulin resistance, and prior bariatric surgery were repeatedly associated with higher perioperative complication rates, particularly when optimization was incomplete.[11] Structured preanesthetic screening allows early identification of these factors and supports individualized anesthetic planning, including monitoring level and postoperative disposition.[11]

Respiratory risk assessment emerged as a critical domain, especially in patients with obesity and suspected obstructive sleep apnea.[12] Several studies highlighted increased rates of perioperative hypoventilation, airway difficulty, and postoperative desaturation when respiratory risk was underestimated.[12] Preanesthetic identification of sleep-disordered breathing enables tailored airway strategies and postoperative monitoring, directly impacting patient safety.[12]

Thromboembolic risk assessment represented another cornerstone of preanesthetic evaluation in abdominal plastic surgery.[13] The reviewed evidence supports the use of structured risk stratification models to guide pharmacological and mechanical prophylaxis decisions.[13] Failure to integrate thromboembolic risk into anesthetic planning was consistently associated with preventable morbidity.[13]

Nutritional and hematological optimization was particularly relevant in post-bariatric patients undergoing body contouring procedures.[14] Anemia, protein deficiency, and micronutrient depletion were associated with increased perioperative complications and impaired recovery.[14] These findings emphasize that preanesthetic evaluation must extend beyond cardiopulmonary clearance to include metabolic and nutritional assessment.[14]

Pain management strategies were also strongly influenced by preanesthetic planning.[15]

Studies evaluating multimodal analgesia and regional anesthesia techniques demonstrated reduced opioid consumption, improved recovery profiles, and shorter hospital stays.[15] This highlights the anesthesiologist's role in designing analgesic strategies before surgery rather than reacting to postoperative pain.[15]

Procedure-related factors, including surgical extent, duration, and combination with other operations, significantly modified anesthetic risk.[16] Combined procedures and high-volume resections were associated with greater physiological stress and higher complication rates.[16] Preanesthetic evaluation plays a key role in determining suitability for outpatient surgery versus inpatient management.[16]

Anesthetic technique selection was shown to influence perioperative outcomes when appropriately matched to patient risk profile.[17] Alternative techniques, including regional or sedation-based approaches, were feasible in selected low-risk patients but required rigorous

preanesthetic selection.[17] These findings reinforce that anesthetic choice should be individualized rather than protocol-driven.[17]

Across studies, enhanced recovery pathways consistently demonstrated improved outcomes when preanesthetic evaluation was fully integrated into perioperative planning.[18] However, heterogeneity in protocol implementation and reporting limits direct comparison between studies.[18] Despite this, the overall evidence supports standardized preanesthetic pathways as a safety-enhancing strategy.[18]

From a methodological perspective, the certainty of evidence was moderate, as most studies were observational and heterogeneous in design.[19] Nevertheless, the consistency of associations across diverse populations strengthens the validity of the conclusions.[19] According to GRADE principles, the clinical relevance of structured preanesthetic evaluation remains high despite limitations in study design.[19]

Overall, the findings of this review support a paradigm in which preanesthetic evaluation functions as an active, preventive intervention rather than a passive screening step.[20]

Risk identification, optimization, and individualized anesthetic planning were consistently associated with improved perioperative safety.[20] This positions comprehensive preanesthetic evaluation as an essential determinant of outcomes in abdominal plastic surgery.[20]

6 CONCLUSION

This systematic review demonstrates that preanesthetic evaluation in abdominal plastic surgery is a decisive determinant of perioperative safety and clinical outcomes. The available evidence consistently shows that patients undergoing abdominoplasty frequently present with complex cardiometabolic, respiratory, thromboembolic, and nutritional risk profiles that require structured and proactive assessment. Comprehensive preanesthetic evaluation functions not merely as a clearance process, but as an active strategy for risk identification and modification.

From a clinical standpoint, these findings reinforce the need to approach abdominal plastic surgery as a major surgical intervention with significant physiological impact. Individualized anesthetic planning based on thorough preoperative evaluation enables appropriate selection of anesthetic technique, optimization of pain management, prevention of thromboembolic events, and informed decisions regarding outpatient versus inpatient management. This approach directly contributes to reduced complications, improved recovery trajectories, and enhanced patient safety.

The main limitations of the current literature include the predominance of observational study designs, heterogeneity in outcome definitions, and variability in preanesthetic protocols across institutions. Many studies relied on retrospective analyses, and standardized reporting of anesthetic evaluation components was often lacking. These factors limit the certainty of evidence and preclude robust quantitative synthesis.

Future research should focus on prospective, multicenter studies evaluating standardized preanesthetic assessment pathways specific to abdominal plastic surgery. Greater emphasis should be placed on defining optimal screening tools, laboratory panels, and risk stratification models, as well as on evaluating the impact of targeted preoperative optimization strategies on long-term outcomes. Integration of anesthetic variables into surgical registries may further strengthen the evidence base.

In conclusion, effective preanesthetic evaluation in abdominal plastic surgery requires an evidence-based, multidisciplinary, and patient-centered approach. Collaboration between anesthesiologists, surgeons, and allied health professionals is essential to align risk assessment, optimization, and perioperative decision-making. Such individualized and systematic strategies represent the most reliable pathway to improving safety and outcomes in abdominal plastic surgery practice.

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