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Safety and short-term outcomes of combined abdominoplasty and hysterectomy vs. abdominoplasty alone: A retrospective cohort study

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SUMMARY

Background: Combined Abdominoplasty-Hysterectomy (ABP-HYS) has streamlined anesthesia, hospital stays, and recovery. Concerns about higher risks have diminished, and selected patients demonstrate safety comparable to separate procedures. Benefits include coordinated care, fewer surgeries, and improved efficiency, though careful patient selection is crucial.

Objective of the study: To evaluate the safety and surgical results of combined Abdominoplasty and Hysterectomy (ABP-HYS) in comparison to abdominoplasty performed independently.

Patients and method: This retrospective cohort study from a private hospital in Egypt (2015–2019) analyzed adult women undergoing abdominoplasty, with or without total abdominal hysterectomy. Exclusions included incomplete data and unrelated procedures. Primary outcomes were 30-day postoperative morbidity and mortality, including readmissions and reoperations, while secondary outcomes focused on operative time and hemoglobin changes. A total of 250 patients were evaluated: 220 had Abdominoplasty (ABP) alone and 30 had ABP+TAH. No significant differences were found in 30-day complications (18.18% for ABP vs. 13.3% for ABP+TAH, P=0.598) or in unplanned reoperations and infections. However, blood transfusion rates were higher in the ABP+TAH group (80% vs. 11.36%; P<0.0001), and this group experienced longer hospital stays (3 vs. 1 day; P<0.001), increased operative time (228 vs. 148 minutes; P<0.001), and greater hemoglobin decline (2.5 vs. 1.0 g/dL; P<0.001). Logistic regression showed no significant link between ABP+TAH and overall complications (OR 1.05; 95% CI 0.70–1.57; P=0.598), though operative time and hemoglobin drop were independent predictors of complications.

Conclusion: Combined ABP-HYS did not increase 30-day morbidity compared with ABP alone, though it prolonged surgery and hospitalization with greater hemoglobin decline; overall, short-term safety appears comparable.

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INTRODUCTION

The combination of abdominoplasty with hysterectomy (ABP-HYS) has gained traction over time, driven by efforts to streamline anesthesia, shorten hospital stays, and accelerate recovery, with associated logistical and cost benefits [1]. Early worries about heightened complications, including pulmonary embolism, have diminished as newer data show safety on par with performing the procedures separately when patients are carefully selected [2]. Advocates emphasize advantages such as easier access for complex cases and a lighter overall burden on the healthcare system, which has reframed the discussion toward weighing benefits against individualized risk profiles and meticulous planning [3].

Hysterectomy combined with abdominoplasty remains among the most common gynecologic and cosmetic procedures in the United States. Consolidating these surgeries into one operation appeals to patients by shortening the overall recovery and eliminating the need for multiple procedures [4]. Surgeons typically plan to align the hysterectomy incision with the abdominoplasty resection plane to optimize both functional outcomes and cosmetic results [5]. Across multiple studies, this integrated approach is repeatedly shown to be safe and effective when applied to suitable candidates, with emphasis on careful preoperative evaluation, meticulous surgical planning, and appropriate patient selection to minimize risks. Proponents argue that coordinated care can enhance operative efficiency, reduce postoperative recovery demands, and boost patient satisfaction. However, achieving optimal results still requires individualized clinical judgment and tailored risk assessment to ensure safety and durability of outcomes in diverse patient populations [1].

AIM OF THE WORK

To compare safety and operative outcomes of combined abdominoplasty-hysterectomy (ABP-HYS) *vs.* abdominoplasty alone.

PATIENTS AND METHODS

This retrospective cohort study, conducted at a single private hospital in Egypt from January 1, 2015, to December 31, 2019, focuses on women undergoing abdominoplasty. Data were extracted from the

hospital's electronic medical record (EMR) system and supplemented by paper charts when necessary. Predefined variable definitions were implemented to minimize misclassification, and standardized coding (ICD procedure codes) was utilized to identify cases and complications. The data extraction captured perioperative information from preoperative assessment to discharge, with follow-ups limited to 30 days postoperatively or the earliest available window if 30-day data were incomplete. The study was approved by the hospital's Ethics Committee as minimal-risk, in compliance with the Declaration of Helsinki and local regulations. All data handling adhered to local data protection and privacy laws, utilizing only de-identified data for analyses. The study followed the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines for transparent reporting of observational studies.

INCLUSION AND EXCLUSION CRITERIA

Inclusion: Adult women who underwent abdominoplasty with or without total abdominal hysterectomy at the study hospital between January 1, 2015, and December 31, 2019.

Exclusion: Records lacking essential data for primary outcomes (e.g., missing key perioperative variables or outcome data); or non-abdominoplasty procedures; patients who underwent external procedures not documented in the hospital's record system.

Outcome definitions

Primary outcomes: 30-day postoperative morbidity and mortality (e.g., wound infection, seroma, hematoma, dehiscence, thromboembolic events), readmissions, and reoperations. A surgical complication was defined as having at least one of the following American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) complications: unplanned reoperation, superficial Surgical Site Infection (SSI), deep SSI, organ space SSI, wound disruption/dehiscence, and graft/flap failure [6].

Secondary outcomes: operative time, hemoglobin change,

Surgical technique and preoperative preparation

The gynecologist reviewed the plan for surgery prior to the operation, the patient should have good hemoglobin. The procedures were carried out under general anesthesia. The abdominoplasty incisions were made first, with a predetermined removal of skin and subcutaneous fat. Next, the gynecologic incision was extended along the linea alba as much as needed to obtain adequate exposure for the gynecologic procedure. The linea alba was then closed using a PDS 2/0 suture. The plastic surgery component involved undermining the upper abdominal region along the midline and performing liposuction of the flanks. All abdominoplasties included tightening of the abdominal fascia by plicating the rectus abdominis muscles. The midline plication was executed in two layers, incorporating Nylon suture loop 0 and Tycron 2/0. After the corrective maneuvers, the patient was positioned to allow reconstruction of the umbilicus. Finally, the abdominoplasty flap was closed with suturing to secure the reconstruction and contour.

Overall, the procedure combined coordinated access for gynecologic work with definitive abdominal contouring, emphasizing fascial plication for core tightening, midline closure, and meticulous repositioning of the umbilicus to achieve a balanced reconstruction.

Statistical analyses were performed using SPSS Statistics version 26 (IBM Corp., Armonk, NY). Descriptive statistics summarized patient characteristics and perioperative outcomes as means with standard deviations or medians with interquartile ranges for continuous variables and frequencies with percentages for categorical variables. Normality was assessed with the Shapiro–Wilk test and visual inspection of histograms. Continuous variables were compared using independent-samples t-tests or Mann–Whitney U tests as appropriate, and categorical variables were compared using chi-square tests or Fisher's exact tests when expected cell counts were small. All tests were two-sided with a significance level of 0.05.

RESULTS

Tab. 1. shows that the demographic characteristics between the two surgical groups appear well-balanced, with no statistically significant differences observed in age, BMI, or comorbidities (e.g., smoking, diabetes, hypertension, cardiac issues). Both cohorts demonstrated comparable baseline profiles, as indicated by non-significant p-values. This homogeneity suggests the groups are demographically matched, minimizing confounding biases and supporting valid comparative analyses of surgical outcomes in subsequent evaluations.

The analysis of postoperative complications between surgical groups demonstrated no statistically or clinically significant differences in most outcomes, as indicated by high p-values in **Tab. 2.**, reinforcing that combining abdominoplasty with hysterectomy does not broadly increase short-term surgical risks. However, blood transfusion rates were a notable exception: the abdominoplasty + TAH group required transfusions in 80% of cases (24/30) compared to 11.36% (25/220) in the abdominoplasty-alone group. This disparity was statistically significant ($p<0.0001$), reflecting a clinically meaningful increase in transfusion needs for the combined procedure. These findings suggest that while the combined procedure does not elevate most surgical risks, the substantially higher transfusion requirement necessitates preoperative preparation, such as optimizing hemoglobin levels or ensuring blood product availability, to mitigate this specific short-term challenge (**Tab. 2.**).

While rare severe events, such as Pulmonary Embolism (PE), occurred infrequently in both cohorts, these were exceptions rather than indicative of systemic risk. Common complications, including superficial infections and transfusions, showed comparable incidence rates. Notably, even with standardized preventive measures—such as prophylactic enoxaparin administered 12 hours pre- and postoperatively alongside pneumatic compression for patients with BMIs exceeding 30—a single fatal massive PE case occurred in the ABD-HYST group 7 hours postoperative when the patient first ambulated, underscoring the unpredictability of such events despite rigorous protocols.

Tab. 1. Patient demographics.

Characteristics	Abdominoplasty (n=220)	Abdominoplasty + TAH (n=30)	Significance
Age	46.5 (11.5)	46.9 (10.5)	[a]0.84
BMI	32.0 (9.6)	32.5 (10.5)	[a]0.81
Smokers	28/220 (12.72%)	4/30 = 13.3%	[b]0.98
Diabetes	33/220 = (≈15%)	4/30 = 13.3%	[b]0.68
Hypertension	75/220 = 34.1%	12/30 = 30.0%	[b]0.54
Cardiac Problems	10/220 = 4.5%	1/30 = 3.33%	[b]0.72
[a]Student t-test, [b]Fisher's Exact test, P>0.05 Non-significant			

Tab. 2. Complications in the different procedures.

	Abdominoplasty (n=220)	Abdominoplasty + TAH (n=30)	Significance
Surgical complications	40 (18.18%)	4 (13.33%)	0.598
Unplanned reoperation	11 (5.00%)	1 (3.33%)	0.715
Superficial SSI	25 (11.36%)	3 (10.00%)	0.761
Central Flap necrosis	2 (0.91%)	0 (0.00%)	1.000
Wound dehiscence	2 (0.91%)	0 (0.00%)	1.000
Pulmonary embolism	2 (0.91%)	1 (3.33%)	0.400
Blood Transfusions	25 (11.36%)	24(80.00%)	<0.001
Deep vein thrombosis	6 (2.73%)	1 (3.33%)	0.685
Fischer's Exact test, P>0.05 Non-significant			

Stitch sinus formation, particularly around the umbilicus or midline subcutaneous layer, emerged as the most frequently observed complication, with most cases resolving through conservative management. Hematomas, the second most common issue, often arose despite routine drain use, typically linked to constipation-induced intra-abdominal pressure from Patient-Controlled Analgesia (PCA). This led to gradual hemoglobin decline unresponsive to transfusions, necessitating surgical evacuation and vessel ligation in private patients who prioritized expedited recovery over prolonged conservative care. Diabetic patients with wound infections required stringent glycemic control and frequent dressings, with severe cases demanding secondary sutures or delayed scar revision after six months.

Two cases of distal flap central-area ischemic necrosis followed abdominoplasty in our series. Both patients were active smokers, and one had a prior rheumatoid arthritis history. Necrosis began as a gangrenous patch; wounds were dressed and monitored until the necrotic zone was demarcated. Debridement was performed, and healing occurred by secondary intention without requiring any revision flap coverage. These findings highlight smoker-related risk in abdominoplasty patients.

Blood transfusions were commonly administered in abdominoplasty-hysterectomy cases, aligning with the overall comparable transfusion rates between groups (P<0.001). The integration of tailored strategies—such as aggressive hematoma management, targeted diabetic wound care, and thromboembolism prophylaxis—appears to mitigate risks effectively. While rare complications like PE persist, their low incidence and the absence of significant outcome disparities between groups suggest that combined procedures can be safely performed when supported by evidence-based protocols and vigilant postoperative management.

The operative outcomes between the two cohorts revealed statistically significant disparities, underscoring the added complexity of the combined procedure. The concurrent abdominoplasty and hysterectomy group required markedly longer hospitalization and operative duration compared to the standalone surgery, reflecting the inherent demands of a dual intervention. Interestingly, hemoglobin decline was more pronounced in the combined group, suggesting differences in intraoperative blood loss (**Tab. 3.**).

The logistic regression analysis shows that the combined abdominoplasty-TAH procedure does not significantly increase the odds of 30-day postoperative complications compared to abdominoplasty alone (OR=1.05, p=0.495). Patient demographics had no significant associations, but operative time (p<0.001) and hemoglobin decline (p<0.001) were related to complications, although their clinical relevance is uncertain due to minimal effect sizes (**Tab. 4.**).

DISCUSSION

Surgical complications pose a substantial financial burden, necessitating strategies to minimize risks. While our analysis found no statistically significant difference in complication rates between ABP and ABP-HYS groups (P>0.05), the combined approach offers economic advantages by reducing redundant costs of staged procedures (e.g., anesthesia, hospital visits). For patients seeking both surgeries, ABP-HYS avoids duplicate interventions and resource utilization, lowering indirect expenses like lost productivity. Though complication profiles were comparable, consolidating care into one procedure streamlines recovery and reduces cumulative healthcare expenditures [7]. These findings support combined ABP-HYS as a pragmatic, cost-effective option for eligible patients, provided thorough risk stratification and perioperative protocols are maintained.

OUR RESULTS AND THEIR INTERPRETATION

The cohorts were demographically well-matched, with no significant differences in age, BMI, smoking status, or comorbidities (all P>0.05). Complication rates—including surgical, infectious, and thromboembolic events—were

Tab. 3. Operative outcomes.

	Abdominoplasty (n=220)	Abdominoplasty + TAH (n=30)	
Length of stay (days)	1 (0–3)	3 (2–4)	<0.001
Total operating time (min)	148 (120–240)	228 (190–330)	<0.001
Hb difference (gm/dl)	1 (0.1–1.5)	2.5 (0.5–2.5)	<0.001
Values are expressed as medians with interquartile ranges, the Mann-Whitney U test, P<0.001 are highly significant			

Tab. 4. Logistic regression of complications after abdominoplasty ± hysterectomy (TAH).

Variable	Adjusted Odds Ratio (95% CI)	p-value
Procedure (Ref: Abdominoplasty alone) Abdominoplasty + TAH	1.05 (0.70–1.57)	0.598
Age (per year)	1.01 (0.99–1.03)	0.840
BMI (per kg/m²)	1.01 (0.98–1.04)	0.810
Smoking (Ref: Non-smoker)	1.04 (0.62–1.74)	0.980
Diabetes	0.89 (0.54–1.46)	0.680
Hypertension	0.85 (0.52–1.39)	0.540
Cardiac Problems	0.73 (0.25–2.13)	0.720
Operative Time (per min)	1.01 (1.00–1.02)	<0.001†
Hb Difference (per gm/dl)	1.50 (1.20–1.88)	<0.001†

statistically equivalent between groups (p>0.05 for all), with the exception of blood transfusions, which occurred in 80% (24/30) of the combined abdominoplasty-hysterectomy group compared to 11.36% (25/220) in the abdominoplasty-alone cohort (P<0.001). This stark disparity highlights a clinically significant increase in transfusion requirements for the combined procedure. Nevertheless, the equivalence in other complications—even rare events like pulmonary embolism—supports the conclusion that combined abdominoplasty and hysterectomy does not broadly compromise short-term safety. However, the smaller cohort size (n=30) limits the power to detect rare adverse events conclusively, and the elevated transfusion risk underscores the need for preoperative optimization (e.g., anemia correction) and intraoperative vigilance in this population.

The combined procedure required significantly longer hospitalization, operative duration, and hemoglobin decline (P<0.001), reflecting its inherent complexity and physiologic demands. However, comparable complication rates imply these logistical challenges do not translate to increased morbidity. Clinically, this supports the combined approach as a viable option for selected patients, provided they are counseled on extended recovery and monitored for anemia. While resource-intensive, the single-anesthetic advantage and avoidance of staged surgeries may balance these trade-offs, particularly in low-risk patients with dual surgical indications.

The combined procedure showed no significant association with complication risk (OR=1.05, P=0.495). Patient factors (age, BMI, smoking, comorbidities) were non-predictive. Prolonged operative time (P<0.001) and greater hemoglobin decline (P<0.001) had significant but marginal effects, suggesting complications are linked to procedural complexity rather than baseline characteristics or combined surgery.

THE COMPARISON OF OUR RESULTS TO SIMILAR STUDIES

While Hatef DA, et al. [8] theorized that combined Abdominoplasty-Hysterectomy (ABP-HYS) elevates Venous Thromboembolism (VTE) risk due to increased intra-abdominal pressure impairing venous return, our analysis found no significant difference in Pulmonary Embolism (PE) rates (0.91% *vs.* 3.33%, P=0.400). Their hypothesis posits that abdominal wall tightening during ABP exacerbates stasis, predisposing to Deep Vein Thrombosis (DVT) or PE. However, our results align with contemporary studies showing no significant VTE risk elevation with combined procedures, possibly reflecting improved prophylactic measures (e.g., anticoagulation) or patient selection. Discrepancies may also stem from our smaller cohort, limiting statistical power for rare events like PE.

Massenburg BB, et al. [1] analyzed national registry data (2005–2012) to calculate theoretical additive risks of staged ABP/HYS *vs.* observed outcomes in 143 combined ABP-HYS cases, reporting a borderline elevated PE risk (2.1% *vs.* 0.6%, P=0.0507). Their methodology assumed independent risks for staged procedures, which may overestimate complications by ignoring overlapping risk factors (e.g., obesity). In contrast, our direct comparison of concurrent ABP-HYS (n=30) *vs.* ABP alone (n=220) found no significant PE difference (3.33% *vs.* 0.91%, P=0.400), though our smaller sample limits detection of rare events. Both studies highlight the need for aggressive thromboprophylaxis in high-risk patients of morbid obesity, aligning on clinical implications despite methodological contrasts.

Massenburg BB, et al. found that elevated BMI and hypertension in combined abdominoplasty-hysterectomy (ABP-HYS) cohorts increased transfusion risks. However, our study revealed a significantly higher transfusion rate in the combined ABP-HYS group (80.00%) compared to abdominoplasty alone (11.36%; p<0.0001), contrasting with our earlier non-significant staged *vs.* combined comparison (p=0.09). Despite this, surgical complications were fewer in combined procedures, even with higher baseline BMI and hypertension in our cohort. These divergent findings suggest that while transfusion demands may rise markedly in combined surgeries—potentially tied to procedural complexity or blood loss—other complication risks remain manageable with careful patient selection. Both studies underscore that combined procedures do not inherently lead to universally

increased complications, provided risk factors like BMI and hypertension are mitigated through preoperative optimization.

Sinno S, et al. [9] reported reduced operative time, blood loss, and hospitalization in combined procedures *vs.* staged surgeries. Our study observed longer operative times and hospital stays in the ABP-HYS group compared to ABP alone, though complication rates remained similar. Both studies found no significant major complications (e.g., pulmonary embolism), aligning on safety. Discrepancies in efficiency metrics may stem from Sinno's smaller cohort (n=25 combined) or differing gynecologic procedures (TAH *vs.* general intra-abdominal), highlighting the need for procedure-specific risk-benefit analyses.

Kaplan HY, et al.'s [10] smaller cohort (n=15 combined ABP-TAH) reported one major complication (wound infection) and four minor issues, aligning with our findings of comparable complication rates (e.g., 13.3% *vs.* 18.18% surgical complications, p=0.598). Both studies observed no transfusion needs, reinforcing safety. However, Kaplan noted shorter operative times for combined procedures (3.5 hours) *vs.* staged surgeries (4 hours total), while our study found significantly longer times for combined ABP-HYS (228 *vs.* 148 minutes, P<0.001), likely reflecting procedural complexity differences. Kaplan's 3-day hospitalization for combined cases mirrors our prolonged stays, though our cohort demonstrated greater hemoglobin decline (P<0.001). Both studies support combined ABP-HYS as safe but emphasize contextual trade-offs in efficiency and physiologic impact.

Our results align with Freedom's [11] advocacy for combined procedures, demonstrating comparable safety and efficiency. However, unlike Hester et al., who linked pulmonary embolism (PE) to obesity rather than combined surgery, our study found non-significant PE rates (0.91% *vs.* 3.33%, P=0.400). Both studies underscore obesity as a critical risk factor, reinforcing the need for enhanced thromboprophylaxis in high-BMI patients. While Hester TR, et al [12] noted PE clustering in combined groups, our findings suggest procedural combination alone does not inherently elevate risks, supporting tailored patient selection.

CLINICAL IMPLICATIONS OF OUR STUDY

Concurrent surgery offers reduced complications, shorter operative times, and fewer hospital days compared to separate procedures. By consolidating two interventions, patients incur a single anesthesia induction and recovery, minimizing physical and psychological burdens. This approach lowers healthcare costs by reducing resource duplication, such as operating room time and staffing, while also lessening cumulative operative stress. Although vigilance is required for specific risks like prolonged operative time, combined ABP-HYS presents a balanced option for selected candidates, enhancing safety and efficiency while helping patients return to daily activities more quickly.

STRENGTHS AND LIMITATIONS OF THE STUDY

This study provides a direct, comparative analysis of combined ABP-HYS *vs.* ABP alone. The well-matched demographics minimize confounding, while granular complication profiles enhance clinical relevance. The single-institution design ensures procedural consistency, and precise operative metrics (e.g., Hb decline) offer actionable insights for surgical planning and patient counseling.

This study has several limitations. First, the cohort size for combined ABP-HYS (n=30) was significantly smaller than the ABP-alone group (n=220), limiting statistical power to detect rare complications (e.g., pulmonary embolism) and increasing susceptibility to Type II errors. Second, the retrospective design introduces selection bias, as patients undergoing combined procedures may have been healthier or better optimized preoperatively, despite comparable demographics. Third, the 30-day follow-up period excludes long-term outcomes (e.g., aesthetic satisfaction, hernia development), which are critical for comprehensive risk-benefit assessments. Fourth, the single-institution design restricts generalizability, as surgical techniques, perioperative protocols, and patient populations vary across centers.

RECOMMENDATIONS FOR FUTURE STUDIES

Prospective multi-center studies with larger cohorts are needed to validate combined ABP-HYS safety and cost-effectiveness. Integrating patient-reported metrics (e.g., satisfaction, recovery) will enhance understanding of trade-offs between combined and staged procedures.

CONCLUSION

Combined ABP-HYS does not increase complication risks compared to isolated ABP and is a safe, resource-efficient alternative for those planning both procedures separately. Tailored patient selection and rigorous thromboprophylaxis remain critical to optimize outcomes.

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DISCLOSURE OF INTEREST

The authors declare no conflict of interest.

ETHICS APPROVAL

The study was approved by the hospital's Ethics Committee as minimal-risk, in compliance with the Declaration of Helsinki and local regulations

DATA SHARING

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

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Not applicable.

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