

# The Safety of Abdominal Contouring in the Presence of a Gastric Band

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**Background:** Gastric bands, specifically the Lap-Band, have been widely used for weight loss. However, little is known about the complications associated with abdominal contouring procedures in patients with Lap-Bands. This study aimed to determine the complication rates and consent processes for these procedures.

**Methods:** We conducted a survey study of 300 members of the American Society of Aesthetic Plastic Surgery. Commonly performed abdominal contouring procedures included abdominal liposuction, abdominoplasty, and combined abdominoplasty with abdominal liposuction.

**Results:** The overall infection rate was low (1%) and did not significantly differ between the procedural groups. Abdominoplasty and combined liposuction with abdominoplasty had significantly higher complication rates (4.7% and 10.5%, respectively) than liposuction alone (1%,  $P = 0.0004$ ). Abdominoplasty procedures also had higher rates of port/tubing malposition (2.3%,  $P = 0.04$ ) and system leaks (1.6%,  $P = 0.003$ ). Approximately 59% of plastic surgeons provided written or dictated consent as part of the standard procedural consent to address the presence of the Lap-Band, whereas 8% of plastic surgeons provided a separate written or printed signed consent specifically related to the procedure in the presence of a Lap-Band.

**Conclusions:** Our study supports the relative safety of aesthetic abdominal contouring procedures in patients with gastric bands but highlights the increased risk of complications in the presence of a Lap-Band. Surgeons should use careful dissection techniques to minimize complications and consider involving a bariatric surgeon, especially with abdominoplasty procedures. Surgical consent should explicitly outline the risks identified in this study to ensure that patients are fully informed. (*Plast Reconstr Surg Glob Open* 2023; 11:e5421; doi: 10.1097/GOX.0000000000005421; Published online 20 November 2023.)

## INTRODUCTION

The Lap-Band is the most popular adjustable gastric band device in the United States. The device comprises an inflatable silicone band laparoscopically placed around the upper stomach. The band is attached to tubing that traverses the abdominal fascia and is connected to a subcutaneous port. Saline solution is used to inflate the band and apply pressure around the outside the upper stomach, limiting the amount of food that can be consumed at one time. The device has experienced a decline in popularity as a primary bariatric surgical option due to high

rates of late complications and device failure, as documented in several studies.<sup>1-4</sup> Understanding these potential complications is crucial when evaluating the safety of abdominal contouring procedures in Lap-Band patients, as the presence of the device can potentially impact surgical outcomes.

Plastic surgeons have noted several types of complications when performing aesthetic body contouring in patients with the Lap-Band system, including system infection, system leak, and port/tubing malposition. Infection is believed to occur when a breach of sterility contaminates the components of the gastric band, whereas a system leak involves the loss of pressurized saline in the inflation system of the Lap-Band. Leaks can occur within the port, at the connection where the tubing meets the

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port, along the length of the tubing, or within the band itself. System leaks typically require reoperation by repairing or replacing the damaged or perforated component of the Lap-Band. These repairs are generally performed by bariatric surgeons. Finally, port/tubing malposition occurs when aesthetic abdominal procedures disrupt the supporting scar tissue that holds the port and tubing in place. The malposition of the port or tubing may interfere with Lap-Band function and the adjustment of the gastric band through the injection port.

Since its FDA approval in 2001, over one million Lap-Band devices have been implanted in the United States.<sup>5</sup> Globally, gastric band placement reached its peak in 2008, accounting for 44% of all bariatric procedures performed that year.<sup>6</sup> However, Lap-Band placement has gradually decreased, with most bariatric surgeons transitioning to gastric sleeve procedures.<sup>7</sup> In 2011, Lap-Band accounted for 35.4% of all bariatric procedures, decreasing to 14% in 2012 and currently standing at 5.7%.<sup>6</sup> Despite the decline, a significant number of patients (over 161,000) in the United States received Lap-Band devices between 2011 and 2019.<sup>6</sup> It is estimated that more than half of the patients who underwent Lap-Band placement still have their devices in place.<sup>7</sup>

Despite the decline in the popularity of Lap-Band procedures, a significant number of patients worldwide have undergone gastric banding and seek abdominal contouring procedures to enhance their body contour. Many of these patients believe that their gastric bands are still functional, whereas others are uncertain or suspect that their banding device may no longer be effective. Moreover, patients with a long-standing gastric band and no ongoing issues often postpone the evaluation or surgical removal of their bands. Currently, there is a lack of comprehensive research evaluating the effect on the safety and complication rates of these procedures in this patient population.

This study aimed to assess the incidence of complications after liposuction, abdominoplasty, and abdominoplasty with liposuction in the presence of a Lap-Band. Furthermore, the study investigated the consent process for Lap-Band patients undergoing these procedures.

## METHODS

The participants for the survey study were randomly selected from the active member roster of the American Society of Aesthetic Plastic Surgery (ASAPS) using randomization software.<sup>9</sup> The survey gathered data on abdominal contouring procedures for patients with a Lap-Band from 2015 to 2019. (See survey, Supplemental Digital Content 1, which displays the supplied survey for the study. <http://links.lww.com/PRSGO/C880>.) Data collection was extended throughout 2020 and into 2021 due to the pandemic in the United States. The survey was sent via email and fax, with up to three repeat surveys sent to each member. In cases of nonresponse, a follow-up phone call was made to each practice.

To gather information, plastic surgeons were asked whether they performed body contouring procedures such as abdominal liposuction and abdominoplasty with

## Takeaways

**Question:** What are the complication rates and consent processes for abdominal contouring procedures in patients with gastric bands?

**Findings:** The overall infection rate was low (1%). Abdominoplasty and liposuction with abdominoplasty had significantly higher complication rates (4.7% and 10.5%, respectively) than liposuction alone (1%,  $P = 0.0004$ ). Approximately 59% of plastic surgeons added a written or dictated consent to the standard procedural consent to address the presence of the gastric band.

**Meaning:** Our study supports the safety of aesthetic abdominal contouring procedures in patients with gastric bands, but highlights the increased risk of complications in the presence of a gastric band.

or without liposuction in patients with Lap-Band devices. The survey also asked surgeons to describe any modifications made to the surgical consent specifically for these patients. Complications associated with Lap-Band devices were assessed for each of the body contouring procedures performed.

## Statistical Analysis

The collected data were collated and analyzed by creating cross-tabulation tables. Chi-square analysis was used to compare the complications and outcomes between the procedure groups, utilizing 3x2 contingency tables.<sup>10,11</sup> Frequencies and percentages were reported and interpreted. When significant findings were detected using the chi-square test, unadjusted odds ratios with a 95% confidence interval (CI) were calculated. Statistical significance was determined at an alpha level of 0.05. All statistical analyses were performed using SPSS software, version 29 (IBM Corp., Armonk, N.Y.).

## RESULTS

In total, 121 surveys were returned (response rate of 40.3%). Plastic surgeons had an average of 16.7 years in practice and performed an average of 128 abdominal contouring procedures yearly. Surgeons were queried about their performance of liposuction in patients with Lap-Band devices. Ninety percent of surgeons performed abdominal liposuction for Lap-Band patients, totaling 489 procedures. Among these surgeons, 77.6% reported modifying their liposuction technique when a Lap-Band was present. These modifications included avoiding the areas near the port or deeper planes where tubing would be located.

Regarding abdominoplasty, 88.7% of surgeons indicated that they performed abdominoplasty in patients with Lap-Band devices (total of 616 procedures). Of these surgeons, 74.1% reported offering fascial plication to Lap-Band patients, with the location and extent of plication determined by the port's position. Surgeons also mentioned the possibility of moving the port to a more favorable position for plication or involving a bariatric surgeon to relocate the

**Table 1. Number and Percentage of Complications for Patients with Lap-Band Devices Undergoing Body Contouring Procedures**

	No Complication	Complication
Abdominal liposuction	484 (99.0%)	5 (1.0%)
Abdominoplasty	587 (95.3%)	29 (4.7%)
Abdominoplasty with liposuction	76 (89.5%)	8 (10.5%)

Significant difference amongst the groups,  $X^2(2) = 20.39$ ,  $P = 0.000037$ .

port during the procedure. Additionally, 8.3% of surgeons indicated that they performed abdominoplasty simultaneously with upper abdominal liposuction (total of 84 procedures). A total of 1189 procedures were performed by the participating surgeons with an overall port-related complication rate of 3.5%. Forty-two complications were reported, including nine infections, 20 port/tubing malpositions/malfunctions, and 13 port/system leaks.

Table 1 details the number of complications and complication rates for each procedure type. Abdominal liposuction demonstrated the lowest major complication rate among Lap-Band patients, whereas the abdominoplasty with abdominal liposuction group exhibited significantly higher complication rates (1% versus 10.5%,  $P = 0.000037$ ). Participants undergoing abdominoplasty with liposuction had 10.19 times higher odds of experiencing a complication (95% CI, 3.25–31.96) compared with those who had abdominal liposuction alone. Similarly, patients undergoing abdominoplasty had 4.78 times higher odds of experiencing a complication (95% CI, 1.84–12.45) compared with those who had abdominal liposuction alone.

Table 2 presents the number of infections associated with each procedure studied. The overall infection rate was 0.8%. No statistically significant differences were found in the risk of infection between the procedures, although two procedure-related infections (one liposuction and one abdominoplasty) led to the development of abdominal abscesses associated with device infections. No fatalities were reported.

Table 3 shows the number of cases involving port/tubing malposition for the procedures studied. The port malposition rate was 1.7%. Patients undergoing abdominoplasty or abdominoplasty with liposuction (2.3% and 3.6%, respectively) demonstrated significantly higher rates of malposition compared with those undergoing liposuction alone (0.6%,  $P = 0.039$ ). Patients undergoing abdominoplasty had 3.77 times higher odds of experiencing port/tubing malposition problems (95% CI, 1.08–13.19), whereas patients undergoing abdominoplasty with liposuction had six times higher odds of port/tubing malposition problems (95% CI, 1.19–30.24) compared with those who had abdominal liposuction alone.

**Table 2. Number and Percentage of Patients with Lap-Band Devices and Infection Undergoing Abdominal Contouring Procedures**

	No Complication	Infection
Liposuction alone	487 (99.6%)	2 (0.4%)
Abdominoplasty	611 (99.2%)	5 (0.8%)
Abdominoplasty with liposuction	82 (97.6%)	2 (2.4%)

No difference between the procedures for infection,  $X^2(2) = 3.76$ ,  $P = 0.15$ .

**Table 3. Number and Percentage of Malposition/Malfunction of Port/Tubing for Patients with Lap-Band Devices Undergoing Abdominal Contouring Procedures**

	No Complication	Malposition/Malfunction of Port/Tubing
Abdominal liposuction	486 (99.4%)	3 (0.6%)
Abdominoplasty	602 (97.7%)	14 (2.3%)
Abdominoplasty with liposuction	81 (96.4%)	3 (3.6%)

Significant difference amongst the groups for complication outcome 2,  $X^2(2) = 6.49$ ,  $P = 0.039$ .

**Table 4. Number and Percentage of Patients with Lap-Band Devices and System Leak Undergoing Abdominal Contouring Procedures**

	No Complication	System Leak
Liposuction	489 (100%)	0 (0.0%)
Abdominoplasty	606 (98.4%)	10 (1.6%)
Abdominoplasty with liposuction	81 (96.4%)	3 (3.6%)

Significant difference amongst the groups for System Leak,  $X^2(2) = 11.78$ ,  $P = 0.003$ .

Table 4 shows the complications related to system leaks. All system leaks were associated with abdominoplasty and plication, with or without liposuction. The overall risk of system leaks for the studied procedures was 1.1%, although the rate varied among each procedure. A significant difference in the rate of system leaks was observed between patients who underwent liposuction alone and those who underwent combined abdominoplasty with liposuction (0% versus 3.6%,  $P = 0.003$ ).

Approximately 32% of plastic surgeons obtained a standard, written, signed informed consent for liposuction and abdominoplasty without specific mention of the Lap-Band. Approximately 59% of plastic surgeons added a written or dictated consent to the standard procedure consent to address the presence of the Lap-Band. Additionally, 8% of plastic surgeons provided a specific written or printed signed consent specifically pertaining to the Lap-Band.

## DISCUSSION

Patients who have undergone gastric banding often seek aesthetic abdominal reconstruction and rejuvenation by plastic surgeons. However, there is limited knowledge regarding the procedures offered, modifications made in the presence of a Lap-Band, associated complication rates, and the informed consent process. This study aimed to address these gaps and inform plastic surgeons about the common potential complications of abdominal contouring procedures in patients with gastric banding devices, provide suggestions to mitigate risks, and assist with the informed consent.

Approximately 90% of surgeons perform liposuction on Lap-Band patients, with the majority modifying their technique to minimize device-related injuries. A similar trend was observed for abdominoplasty, with 74% of the physicians performing plication while making

modifications to accommodate the device. These modifications may involve port relocation, limited plication to the supraumbilical fascia, or plication based on an intraoperative assessment of the port and/or tubing location.

Abdominal liposuction was found to have the lowest complication rate among the reported procedures. The rates of infection and malposition were low, and no system leaks were reported. Two patients who experienced port infections developed abdominal abscesses and required major intra-abdominal surgical procedures for abscess drainage and Lap-Band system removal. These patients presented with fever, abdominal tenderness, and erythema over the port. Abscess formation around the gastric band was observed in both cases. The treatment involved complete removal of the Lap-Band, abscess drainage, intravenous antibiotics, and hospitalization. Although abdominal abscesses are a known complication of Lap-Band surgery,<sup>12</sup> they have not been previously reported in association with abdominal contouring procedures in the presence of a Lap-Band. These cases suggest that band infections in the subcutaneous space can track along the tubing, enter the abdominal cavity, and cause abscess formation. To prevent such problems, minimal manipulation of the port and the surrounding area is advisable whenever possible. If the port needs to be moved, maintaining the protective capsule around the port, and ensuring complete sterility is critical. Patients should be aware that although uncommon, these significant medical complications have been documented and can occur. It is also advisable to consult with a bariatric surgery colleague if the plastic surgeon suspects an infection in the Lap-Band, as abdominal surgical intervention may be required to appropriately treat the patient.

Abdominoplasty, with or without abdominal liposuction, was associated with higher rates of complications, including port malposition/malfunction and system leaks, compared with liposuction alone. This finding can be attributed to the more extensive dissection required in abdominoplasty, with many surgeons opting to plicate the fascia in the upper abdomen. The Lap-Band port and tubing are surrounded by scar tissue and enveloped in a scar capsule, which can be easily disrupted and breached during flap dissection. Plastic surgeons may intentionally open this capsule to assess the position of the port and tubing and prevent disturbance. Some surgeons reported moving the port, as suggested by Wu et al,<sup>8</sup> to enable safer and more comprehensive plication.

Malposition of the port may have resulted from subcutaneous liposuction in the port area, causing disruption to the supportive subcutaneous tissue and the scar capsule. To reduce this risk, liposuction should be avoided in the deeper planes surrounding the port. Although these problems were infrequent, patients should be informed about the measurable but low risk of complications associated with abdominal liposuction.

Malfunction can occur when plication of the abdominal fascia creates kinks or unfavorable bends in the port tubing, obstructing fluid flow. System leakage is likely associated with plication in the region of the tubing, where it can be challenging to accurately identify the tubing's

perforation point through the abdominal fascia and the potentially tortuous course of the tubing as it enters the port. Strategies to reduce the risk of system leaks include avoiding plication when tubing location cannot be directly visualized and considering options for repositioning the port, with or without the assistance of a bariatric surgical colleague.

Plastic surgeons face challenges when dealing with Lap-Band patients who have attenuated upper abdominal fascia or significant rectus diastasis and a midline or paramedian port. These patients may benefit from upper abdominal fascial plication, but their port positions significantly increase the risk of port and tubing complications. Surgeons should engage in detailed discussions with patients in this unfavorable situation and develop a plan to achieve desired outcomes. Options include avoiding upper abdominal plication altogether, having the port relocated by a bariatric surgeon before or during abdominoplasty, or having the plastic surgeon move the port as described elsewhere.<sup>8</sup> In our experience, most patients are willing to cover the costs of having their bariatric surgeon move their port during abdominoplasty, appreciating the care and safety provided by this choice.

Most plastic surgeons surveyed did not verify the functionality of their patients' Lap-Band devices by a bariatric surgeon before performing surgical body contouring, which is concerning, considering the high failure rates of Lap-Band devices. Recent studies have reported failure and revision rates of Lap-Band devices of 32.7% at 7 years<sup>13</sup> and over 50% at 10 years.<sup>14,15</sup> Given these high failure rates, a significant number of patients seeking body contouring may have a nonfunctional banding system. In our practice, we have encountered patients who suspect or know that their band is not holding saline and subjectively feel that the band is nonfunctional. Still, some of these patients may be reluctant to undergo an additional procedure to have the nonfunctional band removed.

To address this issue, we recommend that plastic surgeons consider involving a bariatric surgeon to verify the functionality of the Lap-Band. This approach has the advantage of preventing a patient with a nonfunctional system from blaming the plastic surgeon for the failure of their band device when the aesthetic procedure was not the cause. Without documented verification of system functionality, it becomes difficult to substantiate that the abdominal contouring procedure may have created a functional problem for the Lap-Band.

Our study utilized a brief questionnaire to improve participation and was designed to focus on complications associated with abdominal contouring in Lap-Band patients. However, our study did not address all the potentially confounding factors. One confounding factor is the use of preoperative antibiotics. We do not know if all patients received preoperative antibiotics, and the presence or absence of antibiotics may play a role in infection rates. A second confounding factor is the use of surgical drains. Drains, which occupy the subcutaneous space, can be a source of infection in the presence of a foreign body such as a Lap-Band port. Typically, when utilized, surgical drains are left in place for several days and may allow a



conduit for bacteria to move retrograde towards a Lap-Band port. We do not know what percentage of surgeons utilized surgical drains and if infections were more commonly seen when drains were used. However, based on the study period (2015–2019), we believe that most surgeons used drains either with or without progressive tension sutures. This postulate is supported by the 2023 study by Wen et al,<sup>16</sup> who reported that 42% of surgeons currently use drains without progressive tension sutures, and of those who utilize progressive tension sutures, 74% combine them with drains. Based on the measurable infection rate among abdominoplasty patients, we suggest that surgeons limit the use of surgical drains whenever feasible to reduce the potential for contamination of the Lap-Band port.

Regarding informed consent, most plastic surgeons in the survey provided a supplemental oral consent for Lap-Band patients, which was documented in the patients' medical records. However, this approach may not adequately address the extended risks and details that have been elucidated in this study. Therefore, we suggest that a formal, detailed, and written consent form be presented to Lap-Band patients to outline the additional risks associated with abdominal contouring procedures. These risks should include, but not be limited to, port malposition, system leaks/failures, device infection, abscess formation, sepsis, death, and the medical costs of hospitalization associated with additional procedures to address the above issues. Presenting patients with both a standard procedure consent and a second, printed and detailed additional consent that covers these and other risks can ensure that Lap-Band patients are fully educated and able to make informed decisions about the procedures they will undergo. (See survey, Supplemental Digital Content 2, which displays a sample informed consent for gastric band patients. <http://links.lww.com/PRSGO/C881>.)

### Limitations

There are several limitations to this study, including the low response rate, selection bias, and limited knowledge of functional status of patients' Lap-Band devices. Despite efforts made to encourage participation, the response rate of the survey study was low but consistent with typical medical survey studies.<sup>17–19</sup> We made efforts to encourage surgeons to complete the survey with both emails, fax, and a follow-up phone call. The low response rate in this study can introduce nonresponse bias and potentially limit the generalizability of findings.

The study relied on the involvement of plastic surgeons who are active members of the ASAPS. However, this may introduce potential for selection bias, as the sample may not fully represent all plastic surgeons performing abdominal contouring procedures in Lap-Band patients. Surgeons who are not members of ASAPS or those who chose not to participate in the study may have different practice patterns or experiences, leading to potential limitations in generalizability.

Lastly, many plastic surgeons surveyed were unaware of the functional status of their patients' Lap-Band devices before performing the aesthetic procedure. This could

have influenced the data, as surgical insults to nonfunctional Lap-Band systems may have gone unrecognized. Conversely, patients who believed they had a functional Lap-Band system when they did not could have attributed the failure of their band system to the plastic surgeon, even when the aesthetic procedure was not the cause. This lack of clarity regarding the functional status of the Lap-Band before the procedure introduces a potential confounding factor.

## CONCLUSIONS

The findings of this study support that abdominal contouring procedures in patients with a Lap-Band are relatively safe, as they are associated with overall low complication rates. Specifically, the occurrence of infection in the Lap-Band port is uncommon with liposuction and abdominoplasty, whereas malposition/malfunction of the Lap-Band port and system leaks are more frequently observed with abdominoplasty. Notably, concurrent liposuction of the upper abdomen during abdominoplasty presents the highest rate of complications among the procedures studied.

Conducting a preoperative evaluation by a bariatric surgeon can be helpful in determining the functionality of a patient's Lap-Band system and prevent litigation based on unfounded allegations that a nonfunctional system was harmed during an aesthetic procedure. It is strongly recommended that surgeons provide patients with a detailed and written informed consent, which aids in their understanding of the slightly increased risk associated with body contouring procedures in the presence of a Lap-Band.

## DISCLOSURE

*The authors have no financial interest to declare in relation to the content of this article.*

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