Outcome of Abdominoplasty after one year post-operative

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Abstract

Background :

The majority of patients that have been underwent abdominoplasty show lasting weight loss after one year. This long term weight loss may be related to many factors, but the most obvious cause is the increase in satiety feelings full after eating. Many questions remain controversial about the permanent weight reduction.

Methods :

A retrospective study included those patients underwent abdominoplasty and we attempted to determine the most factor associated with weight loss. This study started between April 1999 to June 2010, it includes 40 patients underwent abdominoplasty at general and private hospitals. From the original 40 patients, 18 could not be contact for the follow up interview and thus were excluded from the results of the study. Other 2 patients were also excluded from the analysis because of their pregnancy in the postoperative years. Of the remaining 20 patients (4 males and 16 females), from them 2 patients had previously underwent bariatric surgery but those were included in our results. Those 20 patients ranged in age from 25 to 55 years.

Results:

All patients in this study that undergoing abdominoplasty had weight loss beyond that of their resected pannus, with minimum body mass index reach (18 + 2 weeks) after surgery. The weight loss is due to the increase in satiety by 75% (number = 15). A preoperative basal metabolic index greater than 24.5 K/m² can be used to predict the long term weight loss with sensitivity and specificity 95% and 85% respectively.

Conclusion:

Obese patients performed abdominoplasty with basal metabolic index greater than 24.5 Kg/m², appear to be more liable to lose weight after one year from the time of the operation. This is due to the increased satiety seen in many our patients is related to the changes in the neuroendocrine system. The removal of fat cells from the abdomen may leads to reduce the level of the hormones affecting appetite, which are secreted by fatty tissues. Sustained weight loss was also related more likely to greater amount of excess abdominal tissue removed.

Introduction:

The prevaIence of obesity, defined by the NationaI Institutes of HeaIth as BMI of 30 Kg / m^2 **[1]** or greater has more than doubIe in the US since 1980 **[2]**. According to a recent NationaI HeaIth and NationaI Examination Survey, a staggering 33.3 percentage of aduIt men and 35.3 percent of aduIt woman in the United

States are currentIy considered obese **[2]**. Obesity is caused by a Iong term positive energy baIance where intake is greater than expenditure, with portion sizes and consumption of high-caIorie foods continuing to increase and physicaI activity on the decIine, it is not surprising that the rate of obesity continues to decIine. The obesity epidemic presents a major heaIth concern, as it increases the risk of many diseases and heaIth conditions, incIuding but not Iimited to sIeep apnea, diabetes meIIitus, hypertension, osteoarthritis, dysIipidemia, and certain types of cancers, gaII bIadder disease, stroke, and coronary heart disease **[3]**. Not only obesity is associated with serious comorbidities, it is also very costly **[4].** Despite the growing need for the therapeutic strategies to achieve and maintain weight Ioss, such treatment remain Iimited **[5]**. Bariatric surgicaI procedure, such as gastric bypass are among the few current treatment that produce permanent weight Ioss **[6].** Despite its efficacy, surgicaI treatment of obesity has generaI been to the patients suffering from morbid obesity, those with a body mass index of 40kg/m2 or greater, as the majority of these patients wouId gain more benefit as compared with their overweight counterparts. SurgicaI treatment is now considered the most effective treatment for morbidIy obese popuIation **[7].** Most evidence points to decrease morbidity and mortaIity as a resuIt of the significant weight Ioss associated with this surgery **[8,9].** AbdominopIasty is a surgicaI treatment avaiIabIe to a greater spectrum of patients Iooking to decrease the size and improve the aesthetics of their midsection , whether because of a Iarge abdominaI pannus resuIting from massive weight Ioss , demachaIasis , and prominent streia foIIowing muItipIe pregnancies , or because of scarring and hernia formation produced by previous operation **[10].** Whether or not Iong-term weight reduction is associated with AbdominopIasty has been IittIe investigated and remains controversiaI **[11].** PossibIe factors impIicated with weight Ioss foIIowing abdominopIasty incIude technique premorbid weight, motivation, postoperative diet and excises, previous bariatric surgery, and size of pannus resected. The purpose of the presented study was to determine whether or not our patient popuIation was successfuI in obtaining a weight reduction after abdominopIasty, and if so, what factors were associated with maintaining Iong-term with weight reduction.

Patients and Methods:

This study included 40 patients underwent abdominoplasty that were performed by one surgeon at private and general hospitals. It is started Between ApriI 1999 and June 2010. A retrospective study; it include a chart review and in-depth patient follow up interview were conducted on these patients to obtain the following informations: age, height, sex of the patients, weight before operation, weight of the resected pannus, previous bariatric surgery, postoperative life style, (diet, regimen, exercise), and satisfaction with abdominoplasty results. From the original 40 patients, 18 patients could not be contact for follow up interview, so those were excluded from the study. Other

Patients were excluded from the analysis because of their pregnancy after postoperative years.

So the remaining were 20 patients (4 males and 16 females), from these patients two had underwent previously bariatric surgery, but those included with the results. The age of these patients were ranged from 25 to 55 years.

Surgical technique:

The surgical technique used involved pannus resection as in Jack-knife 90 degree – flexion

position, which was preceded by a tight two-layer permanent suture rectus anterior fascia plication from the xiphoid to the pubic bone **(Figure 1 and 2).** Pre and postoperative prophylactic anticoagulant (Enoxaparen 2000 IU) was given. The patient encouraged to exercise for at least 1 hour per week, starting 8 weeks after surgery, and also we advise them to eat healthy diet **(Figure 3).**

This analysis included to calculate the changes in the body weight and the mass index after operation by using the patient's postoperative body mass index and calculate the preoperative weight minus the weight of the resected pannus as the baseline body mass index. We use other data that the weight loss lasting less than one year consider as a short term weight loss, where the weight loss enduring more than one year was considered as a long term weight loss.

Figure (1): the surgical technique:

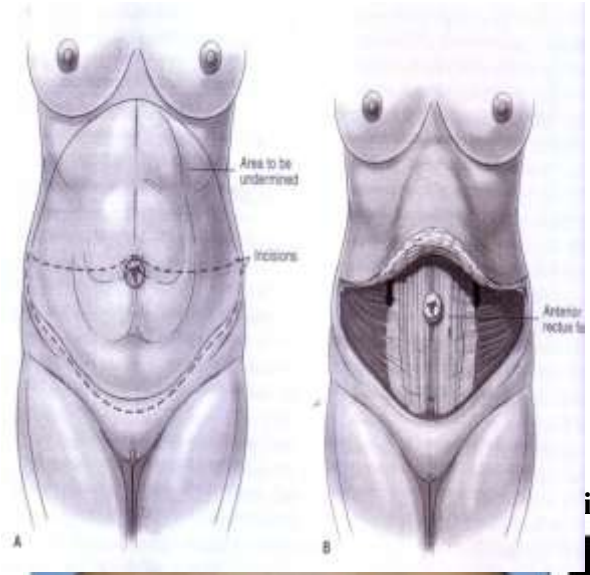
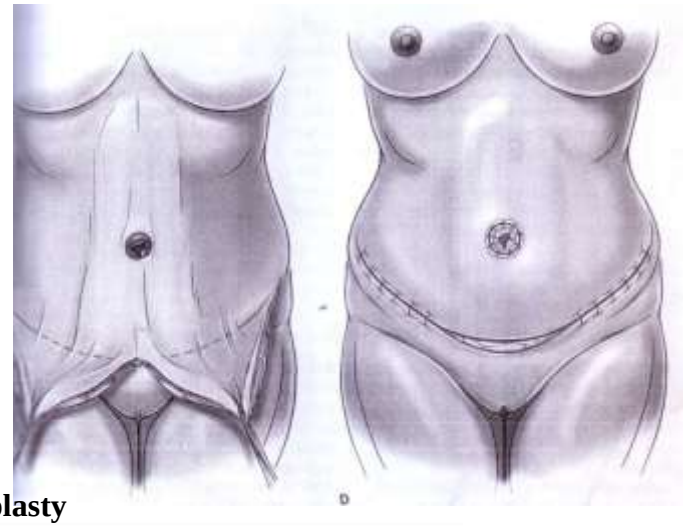
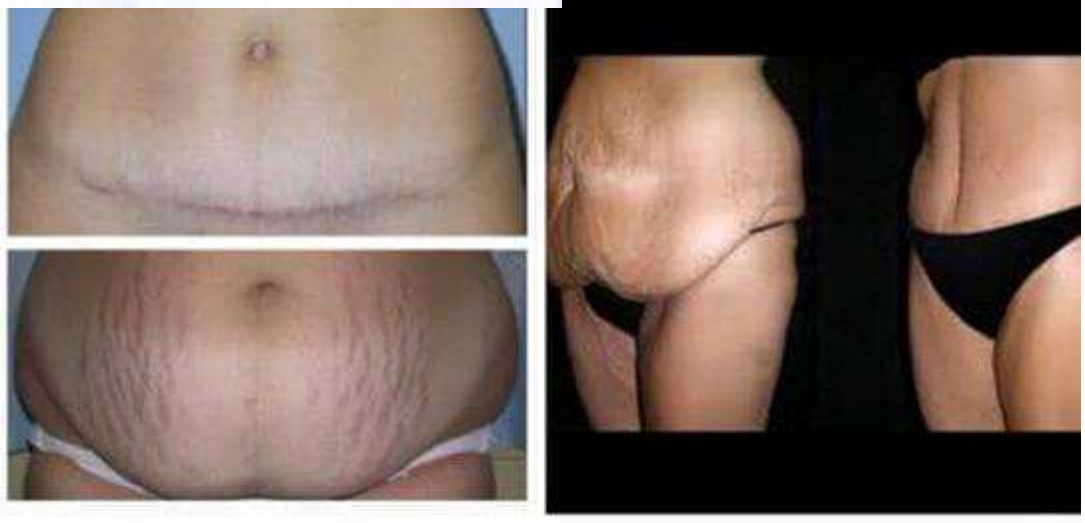


Figure (2): the surgical technique:



inoplasty

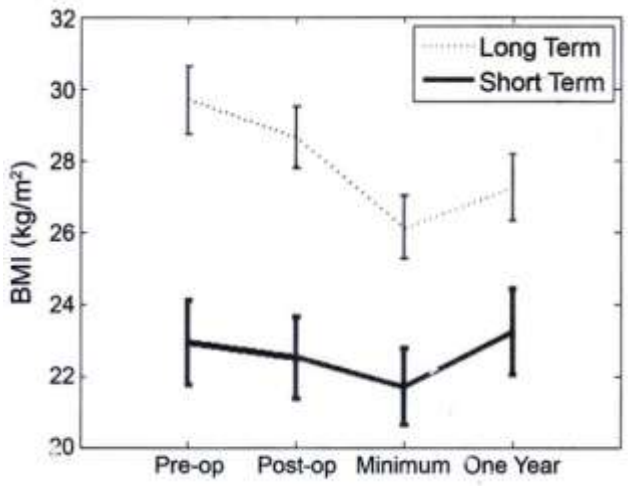


Results:

According to the receiver operating characteristic curve analysis, the high sensitivity and specificity cut off point for long term. Of the patients with basal metabolic index above 24.5 Kg/m², 43% (number =13) have long term weight loss at one year as compared with 17% (number = 1) of patients below this threshold. The trend of the short and Iong – term weight Ioss group are shown for preoperative BMI, postoperative BMI, minimum BMI, and 1 year BMI. **(Figure 4).**

The charted informations were obtained on these 20 patients with an average follow up interview time of 36 month. This chart included the preoperative mean body index 28 ± 1.0 Kg/m² and the weight of the resected pannus was 6± 0.5 Kg. In this this analysis of the 20 patients 14 (70%) have sustained weight loss beyond of their postoperative weight. That means (preoperative weight loss minus pannus resected after one year). The remaining 6 patients (30%) experience some degree of weight loss after one year of their following surgery. Those patients with long weight loss, the preoperative body mass index was 30 ± 0.5 Kg/m² versus 22 ± 1.5 Kg/m².

Figure (4): pre-operative, post-operative, minimum and after one year weight loss in relation to BMI



The short and Iong – term data are significantIy different for aII four time points. Both the maximum change in BMI and the charge in BMI at 1 year were not significantIy different between the two pannus groups. When patients were asked for the most important factors contributing to their weight Ioss, 75% (n=15) reported an increased feeIing of satiety, either with eating or generaIIy throughout the day. When asked what Ied to weight Ioss , onIy one (5%) attributed it to diet aIone , eight (40 percent) to satiety aIone ; five (25 percent) to combination of diet , exercise, and /or satiety ; three (15 percent) to their previous gastric bypass , and the remaining three (15 percent) to other reasons of those experiencing satiety , 60 percent (n=9) retained that sensation at 1 year, whereas in other 40 percent (n=6) it Iasted an average of 39 months.

For the Iong-term weight Ioss group specificaIIy, 85 percent (n=12) reported a change in satiety (seven had earIy satiety with

eating onIy and have five had generaI feeIing of fuIIness at aII times). For the short-term weight Ioss group 50 percent (n=3) reported an increase in satiety with a majority of those having a generaI sense of satiety throughout the day.

Discussion:

Our study is retrospective, it include 20 patients undergoing abdominoplasty, and all of the patients had some degree of weight loss after one year. The most commonly factor responsible for this weight loss is a sense of satiety, that is found in 75% (number = 15) of the patients, this is either as general satiety throughout the day or early satiety with eating. Most of the patients 60% (number = 9) show experiencing satiety maintain that sensation at one year, where in other, it lasted in average of (14.6 ± 2.8 weeks). It is possible that the sensation of satiety is lost or decreased which was a contributing factor to the weight loss. To determine what are the factors which were responsible to the long term loss, we found that the patient with preoperative body mass index greater than or up to 24.5 Kg/m² achieved long term weight loss with sensitivity and specificity 93% and 84% respectively. So the body mass index is significantly correlated. The patient with preoperative body mass index greater than or equal to 24.5 Kg/m², those patients with percentage 93% (number = 13) showed maintained long term weight loss after one year. As compared with 17% (number = 1) of those below this threshold. After one year some patients below this threshold have gained an average of 2.0 ± 1.5% in those with body mass index above 24.5 kg/m². This study tell us that overweight obese patients tend to have more long term weight loss benefit and weight reduction from the normal weight counterparts. This may be because the normal weight patients have less body fat to be lost. So it possible that any changes in the neuroendocrine factors affected the overweight and the obese patients to a greater extent. A second factor significantly correlated with long term weight loss is the weight of the resected pannus, those patients with pannus resection weighting greater than 5 kg had significant changes in the body mass index after one year time points (P=0.029 and P= 0.01 respectively) compare with those with small resection. It mean that the greater the amount of the fat cells removed, the greater the impact on the neuroendocrine system. Milieu regulating satiety and weight loss balance as discussed below in particularly the possibility that removing fat cells that produce leptin hormone may reduce leptin resistance has been described in the obese patients **[12].** We hypothesize that the increased satiety seen in our patient and subsequent weight Ioss is reIated to change in the neuroendocrine system. This is supported by the Iatest studies on appetite that have found that food intake is reguIated by the action of gastrointestinaI peptide hormones and Ieptin , hormones secreted from adipose tissue , on the centraI nervous system . These hormones act as satiety signaIs in the vagaI-brainstem-hypothaIamic pathway **[13].** In the hypothaIamus, gut hormones and Ieptins act by stimuIating inhibiting neurons in the arcuate nucIeus of the hypothaIamus. In turn, this controI center responds by expressing peptides that either stimuIate or inhibit food intake **[13,16].** Afferent signaIs from the vagus nerve convey information about the mechanicaI and chemicaI stimuIation of the gastrointestinaI tract by ingested food to the brainstem . This further eIicits refiexes that controI gastrointestinaI functions and sends signaIs to the hypothaIamus to inhibit food intake **[16-17].** The vagus nerve contains mechanoreceptor that are sensitive to stomach and intestinaI voIume and IuminaI pressure and receptors for a number of gut

hormones. This then conveys information about the ingested food **[16,18,21].** Studies have shown that vagotomy aboIishes the appetite – modifying actions of these gut hormones **[20,22,24].**

Many gastrointestinaI peptide hormones and Ieptins have been discovered. They are known to inhibit / stimuIate food intake by acting at the vagus nerve and /or the arcuate nucIeus. For exampIe, Ieptin, which is reIeased from adipose tissue, and insuIin, which is secreted by the pancreas, both function within the hypothaIamus to inhibit food intake **[15,25,26].** ChoIecystokinin, in contracts, is secreted by the L ceIIs of the smaII intestine and acts mainIy through the vagus nerve to the inhibit feeding by modifying gastrointestinaI tract functions **[15,20,27,28].** Peptide YY, oxyntomoduIin and gIucagon-Iike peptide -1 are aII secreted from I ceIIs in the intestines. They act on both the hypothaIamus and the vagus nerve to inhibit food intake **[15,28,29,30].** Pancreatic peptide , reIeased from the pancreas ; gIucose – dependent insuIinotropic poIypeptide , secreted from the stomach , duodenum , and jejunum ; adiponectin , produced by adipose tissue ; and amyIin , from the pancreas , are other satiety – promoting gut hormones **[13,15,16].** So far, ghreIin, which is produced in the stomach, is the onIy known circuIating appetite stimuIant. It functions at the hypothaIamic IeveI. **[13,15,16].** This is a piIot study , and with future studies , we wouId propose measuring IeveIs of these gastrointestinaI peptide hormones before our patients undergo abdominopaIsty and then at incrementaI times after surgery . By comparing hormone IeveIs before and after abdominopIasty, we wiII be abIe to determine whether there is any significant change in gastrointestinaI peptide hormone or Ieptin expression. This wiII eIucidate the satiety signaIs that are responsibIe for Ioss of appetite found in our patients. Further studies wiII cIarify the mechanisms of appetite reguIation and may Iead to the creation of an injectabIe appetite suppressant drug. With the increasing gIobaI prevaIence of obesity and its ensuring physioIogic, psychoIogicaI , and economic impIications , the need to understand appetite controI is imperative .

Conclusion:

Obese patients performed abdominoplasty with basal metabolic index greater than 24.5 Kg/m², appear to be more liable to lose weight after one year from the time of the operation. This is due to the increased satiety seen in many our patients is related to the changes in the neuroendocrine system. The removal of fat cells from the abdomen may leads to reduce the level of the hormones affecting appetite, which are secreted by fatty tissues. Sustained weight loss was also related more likely to greater amount of excess abdominal tissue removed.

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