

## A Suggestive Algorithm for Management of Abdominal Obesity after Massive Weight Loss

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### ABSTRACT

**Introduction:** The development of effective bariatric surgical techniques to manage morbid obesity has led, over recent years, to a demand for surgical restoration of body morphology through plastic surgical techniques. After a rapid and massive weight loss, there is a sudden change in BMI which leads to skin and soft tissue excess and poor skin tone.

**Patients and Methods:** This study was conducted on 30 patients requesting abdominal contouring after massive weight loss (MWL). All patients presented at Assiut University Hospitals from June 2012 to January 2015. Guided by the site and distribution of skin redundancy in the abdomen, the 30 patients were classified into three groups, group 1. Patients have skin redundancy limited to anterior part of the abdomen (n=13), group 2 Patients have skin redundancy on anterior and lateral parts (flanks) of the abdomen (n=15). Group 3 Patients have circumferential redundancy in the lower trunk (n=2). Different techniques were done according to site of skin redundancy.

**Results:** The patient's age ranged from 22 to 42 year old with a mean age of 32.4 year. About 63.3% of the studied patients were females, where 36.7% of them were males. Only two patient of the studied sample had circumferential abdominoplasty, where 15 patients (50.0%) had extended abdominoplasty technique and 13 patients (43.3%) had traditional abdominoplasty. Ten percent of the studied patients had seroma and wound dehiscence complications after abdominoplasty, where 3.3% of them had haematoma.

**Conclusion:** We recommend an algorithm when dealing with each case of abdominal redundancy after massive weight loss, depending on distribution of skin redundancy in the abdomen for abdominal redundancy in anterior abdomen traditional abdominoplasty is the choice. When redundancy extends to the flank, extended abdominoplasty was done, but if the redundancy is circumferential in nature, circumferential abdominoplasty is the choice.

### INTRODUCTION

The development of effective bariatric surgical techniques to manage morbid obesity has led, over recent years, to a demand for surgical restoration of body morphology through plastic surgical techniques. The vast expanses of redundant skin, which remain following massive weight loss, have led

plastic surgeons to adapt existing techniques of body contouring for a coherent strategy of morphologic restoration. Massive weight loss (MWL) is defined as 50% or greater loss of the excess weight [1].

Restorative surgery should be deferred until the patient has reached a stable weight in order to offer the best guarantee of long-term optimal results. It is best to wait at least a year after the patient has attained a stable weight at or near his weight loss goal [ideally, a body mass index (BMI) <32]. In some cases the patient may have already undergone significant weight loss but not yet attained his target weight [2].

The contour deformities after massive weight loss encompass diverse and unexpected manifestations that potentially involve every area of the body. After a rapid and massive weight loss, there is a sudden change in BMI which leads to skin and soft tissue excess and poor skin tone. In the lower trunk, the redundant tissues of the lower abdomen and the pubic area fall directly towards the inner thighs. There can be enormous overhanging pannus that disrupts the silhouette. The collapse of the redundant tissues from the lower abdomen, mons pubis, buttocks as well as from the medial thigh itself contribute directly to the excess tissues along the thighs resulting in both a vertical and horizontal tissue excess.

### PATIENTS AND METHODS

This study was conducted on 30 patients requesting abdominal contouring after massive weight loss (MWL). All patients presented at Assiut University Hospitals from June 2012 to January 2015.

All patients underwent extensive preoperative evaluation in the form of history taking, thorough physical examination, complete laboratory inves-

tigations, psychiatric evaluation, and tests for assessment of general health and associated comorbidities. Each patient was photographed into six views: Frontal view, right and left lateral views, right and left lateral oblique views, and back view. Guided by the site and distribution of skin redundancy in the abdomen, the 30 patients were classified into three groups:

*Group 1:* Patients have skin redundancy limited to anterior part of the abdomen. Members of this

group were assessed to be candidate for traditional abdominoplasty. (Fig. 1).

*Group 2:* Patients have skin redundancy on anterior and lateral parts (flanks) of the abdomen (n=15). This group were assessed to be candidates for extended abdominoplasty. (Fig. 2).

*Group 3:* Patients have circumferential redundancy in the lower trunk (n=2). This group was assessed to be candidates for circumferential abdominoplasty. (Fig 3).

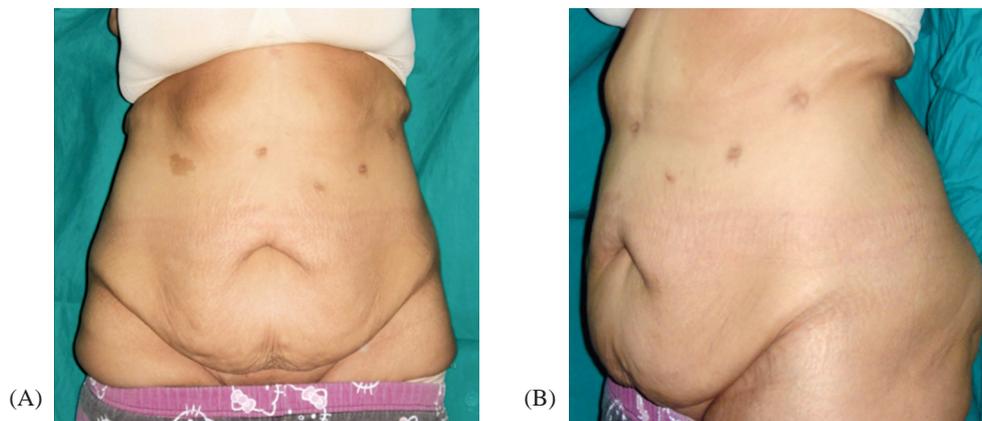


Fig. (1): A: Anterior view, B: Oblique view. Female patient with massive weight loss after bariatric surgery, with skin redundancy restricted to anterior abdomen who underwent traditional abdominoplasty technique.

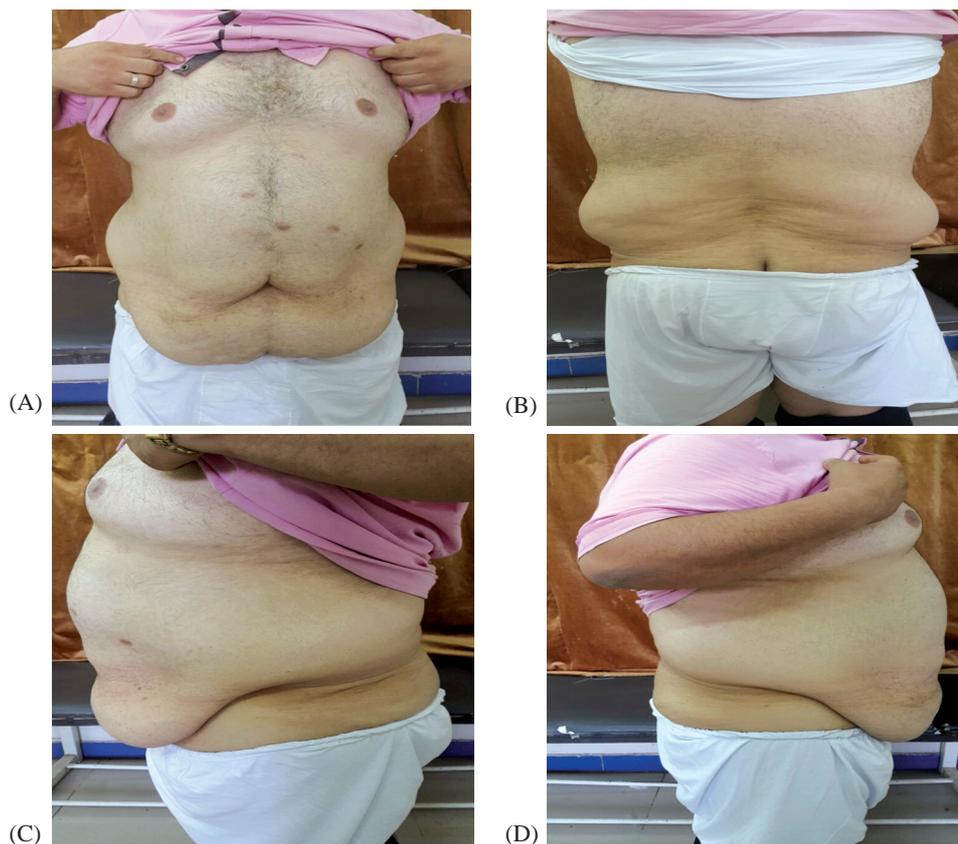


Fig. (2): A: Anterior view, B: Posterior view, C: Left lateral, D: Right lateral. Male patient with massive weight loss after bariatric surgery, with skin redundancy in anterior and lateral abdomen who underwent extended abdominoplasty technique.

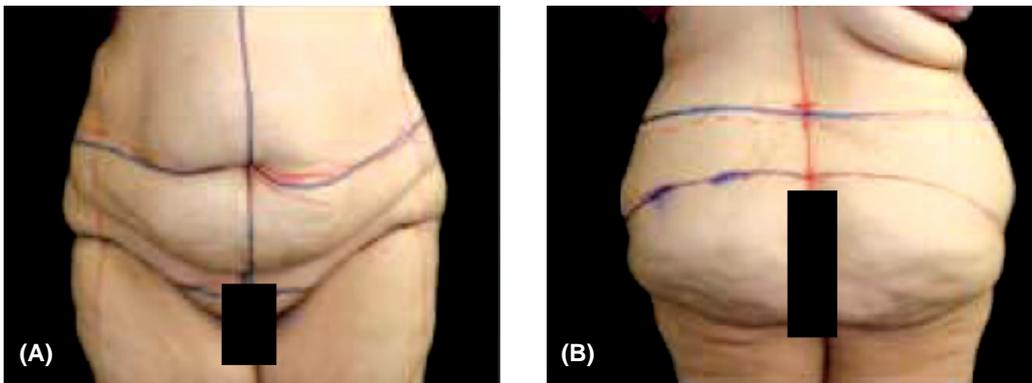


Fig. (3): A: Anterior view, B: Posterior view. Female patient with massive weight loss after diet restriction, with skin redundancy circumferentially in the abdomen who underwent circumferential abdominoplasty technique.

Postoperatively all patients received intravenous broad spectrum antibiotic covering both gram positive and gram negative organisms for five days duration. Evaluations were performed one month postoperatively for anthropometric measurements, muscle and skin laxity. Photographs were taken one month post-operatively to evaluate the results.

**RESULTS**

This study was conducted upon thirty patients in a period of 36 months from 2012-2015. The patient's age ranged from 22 to 42 year old with a mean age of 32.4 year. About 63.3% of the studied patients were females, where 36.7% of them were males.

Table (1): Pre-operative anthropometric measurements.

N=30	Range	Mean±SD
Original weight	89–180	128±25
Height	153–182	169.4±8.2
BMI before weight loss	33.4–63.8	44.5±7.3

Only two patient of the studied sample had circumferential abdominoplasty, where 15 patients (50.0%) had extended abdominoplasty technique and 13 patients (43.3%) had traditional abdominoplasty. (Fig. 4).

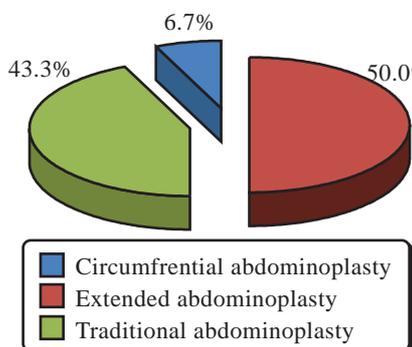


Fig. (4): Distribution of abdominoplasty operative technique.

Eighteen patients (60.0%) were married, where only 12 patients (40.0%) of the studied sample were single.

In the studied patients, the original weight ranged from 89 to 180kg with a mean weight of 128kg. Height ranged from 153 to 182cm with a mean of 169.4cm. BMI is ranged from 33.4 to 63.8 with a mean of 44.5. (Table 1).

There are 63.3% of our patients lose their weight by bariatric surgery and 36.7% of them lose their weight using diet restriction. The weight after stabilization was ranged from 60 to 100kg with a mean of 76.03kg, where their BMI after weight loss ranged from 22.1 to 35.4 with a mean of 26.4. (Table 2).

Table (2): Post-massive weight loss measurements.

N=30	Range	Mean±SD
Weight after stabilization	60–100	76.03±9.14
BMI after weight loss	22.1–35.4	26.4±2.4

In our study, 50.0% of the studied patients had anterior & lateral skin redundancy, where 43.3% of them had anterior skin redundancy, but only two patients had circumferential skin redundancy. (Fig. 5).

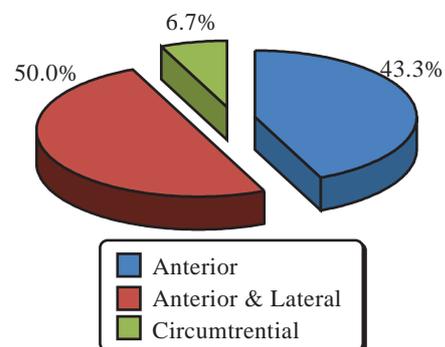


Fig. (5): Distribution of the site of redundancy.

In our study, the mean waist circumference was decreased from 98.3 before abdominoplasty surgery to 89.6 post-operatively with a significant difference of ( $p < 0.01$ ). In case of hip circumference, the mean value decreased from 116.9 to 112.8 with a significant difference of ( $p < 0.01$ ).

Ten percent of the studied patients had seroma and wound dehiscence complications after abdominoplasty, where 3.3% of them had haematoma. (Table 3).

Table (3): Post-operative complications (n=30).

Complications	No.	%
Seroma	3	10.0
Wound dehiscence	3	10.0
Haematoma	1	3.3
Necrosis	0	0.0
Infection	0	0.0

In our study 16.7% of patients were found to have redundancy. (Table 4).

Table (4): Distribution of recurrent redundancy (n=30).

Redundancy	No.	%
Yes	5	16.7
No	25	83.3

*Case 1:* Female patient with massive weight loss after bariatric surgery, with skin redundancy restricted in anterior abdomen who underwent traditional abdominoplasty technique.

*Case 2:* Male patient with massive weight loss after diet restriction, with skin redundancy in anterior and lateral abdomen who underwent extended abdominoplasty technique.

*Case 3:* Female patient with massive weight loss after bariatric surgery, with skin redundancy circumferentially in the abdomen who underwent circumferential abdominoplasty technique.



Fig. (6): A: Preoperative anterior view, B: One month postoperative anterior view, C: Preoperative lateral view, D: One month postoperative lateral view. Female patient with massive weight loss after bariatric surgery, with skin redundancy restricted in anterior abdomen who underwent traditional abdominoplasty technique.

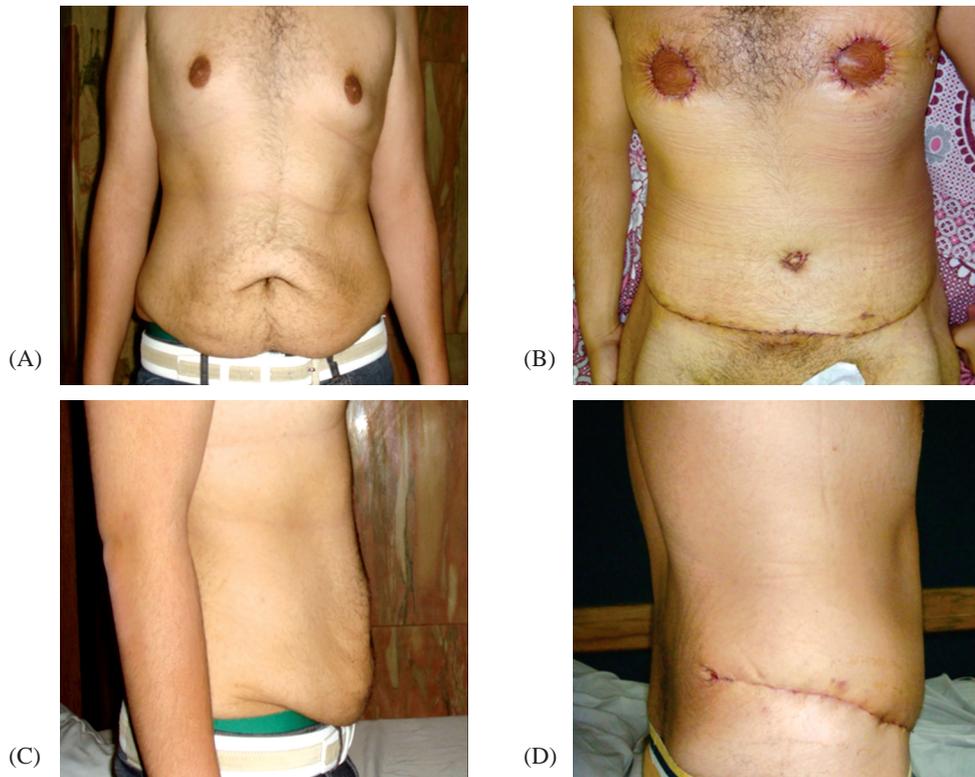


Fig. (7): A: Preoperative anterior view, B: Three weeks postoperative anterior view, C: Preoperative lateral view, D: Three weeks postoperative lateral view. Male patient with massive weight loss after diet restriction, with skin redundancy in anterior and lateral abdomen who underwent extended abdominoplasty technique.

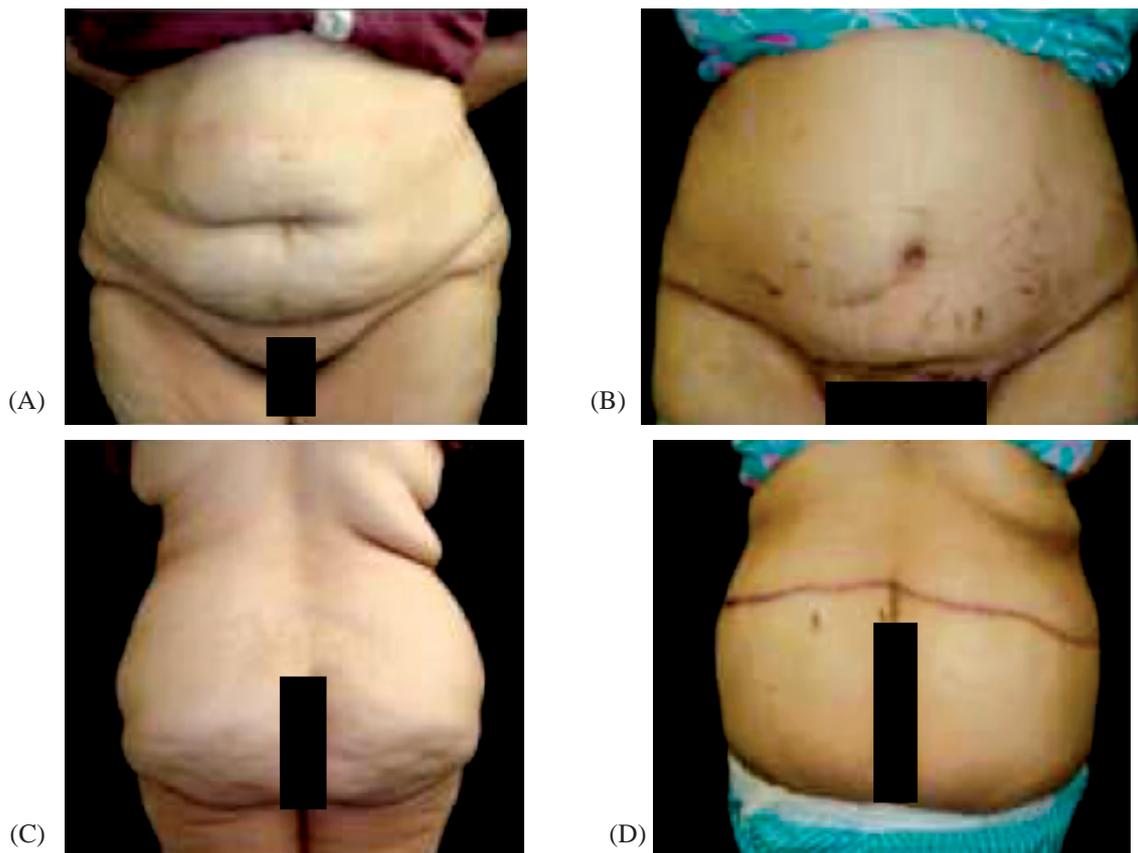


Fig. (8): A: Preoperative anterior view, B: One month postoperative anterior view, C: Preoperative posterior view, D: One month postoperative posterior view. Female patient with massive weight loss after bariatric surgery, with skin redundancy circumferentially in the abdomen who underwent circumferential abdominoplasty technique.

## DISCUSSION

In our study, 63.3% of cases had massive weight loss after bariatric surgery, and 36.3% of cases after restricted diet, which is nearly the same like Koller & Hintringer, who reported in 2011 that 62% of their cases lost weight through bariatric surgery and 38% following lifestyle changes [3].

Statistical analysis of our cases revealed that the most common site of skin redundancy in the lower trunk following massive weight loss was present in anterior and lateral parts, representing about 50% of our cases.

Extended abdominoplasty was the most commonly used technique because most of the cases in the study had skin redundancy confined to the anterior and lateral parts of the abdomen.

Pierr and his colleagues reported that subsequent circumferential truncal excess is not adequately corrected by common abdominoplasty techniques [4]. Therefore, more specific plastic surgery techniques have been developed and refined. Gonzalez-Ulloa described circumferential abdominoplasty in 1961, Lockwood in 2005 introduced the concept of lower body lift [5].

In our study we found a clear variation in distribution of deformities in the lower trunk after massive weight loss. Most literatures reported that in the majority of cases after massive weight loss the deformity is circumferential in nature aly, 2003. Consequently the treatment will be circumferential to address this deformity. But in our study we found that redundancy and deformity in some cases may be restricted to different sites [6].

In some of our cases, the deformity and skin redundancy were confined only to the anterior abdomen (n=13) and in these cases the traditional abdominoplasty was sufficient to correct the deformity.

In other cases, the deformity extended laterally to the flanks beside anterior abdomen (n=15), in which traditional abdominoplasty was not enough, necessitating extension of the incision to address this deformity by extended abdominoplasty technique.

In the third group of patients, the deformity was circumferential in nature (n=2), and should be treated by a circumferential technique.

The overall complication rate in our study was 23.3% which is considered somewhat lower than other studies. This was attributed to the small

number of cases in our study. For example circumferential abdominoplasty usually carry higher rate of complications. In our study, we had only two cases who had been operated by this technique.

The most common complication in our study was seroma, affecting 10% of all cases (n= 3). Two of these cases were operated by extended abdominoplasty, and one case was operated by traditional abdominoplasty. Pierr G. and his co-workers in 2009 reported 5% of cases complicated by seroma, in their study on 118 patients. Michele A. and his group in 2008 reported 14% of cases complicated with seroma, which is slightly higher than our study. Thomas and his co-workers reported 12.9% of case complicated with seroma, which is nearly consistent with our study [7].

Three cases in this work were complicated by superficial wound dehiscence (10%), two of these cases were operated by circumferential abdominoplasty this may be caused by difficulty in positioning of patients, and one traditional abdominoplasty. Michele et al., reported in their study higher wound complications (17%).

Thomas and his group in 2006 reported (14.4%) of cases complicated with wound complications. Pierr G. and his colleagues in 2009 reported (16%) incidence of wound healing problems in his study. All cases of dehiscence were just superficial that didn't necessitate secondary sutures and healed by secondary intention [7].

Only one case complicated by haematoma (3.3%), which had been operated by extended abdominoplasty. Michele A. and his co-workers in 2008 reported three cases in their study (1%) complicated by haematoma which is consistent with our study.

The best technique in our study was the extended abdominoplasty as regard the improving of the hip and waist circumference, this may be expired by the extended incision reaching the waist and hip.

In our study, skin relaxation and recurrence of skin redundancy occurred in 16.7% (n=5) of cases, while 83.3% had no redundancy postoperatively, this might be explained by loss of skin recoil that occur in massive weight loss patients, further loss of weight that may be a cause of recurrence hadn't been occurred in our study.

Method of weight loss, even after bariatric surgery or diet restriction didn't affect the decision or choice of the technique done in our study.

The key of achieving successful patient outcomes is the careful evaluation and the selection of the surgical modality. It is also important to explain to the patient the nature of the long incisions needed for the operations and frequently suboptimal wound healing and scarring which are inevitable.

Stable weight for minimum six months, good evaluation of distribution of skin redundancy and consequently the choice of the technique. And reconciliation with the patient about scarring and contouring should be done in every case. In this study, careful preoperative assessment and evaluation of contour deformities in the abdomen after massive weight loss was carried out according to the site and distribution of skin redundancy, the best technique is carefully chosen. Thus optimizing the good outcome and minimizing or avoiding complications.

The most common site of skin redundancy following massive weight loss in our study is anterior and lateral parts of the abdomen, representing 50% of cases followed by anterior part of abdomen then circumferential distribution of lower trunk. Extended technique decrease waist and Hip circumference more than other techniques.

#### *Conclusion:*

From our study we recommended careful preoperative evaluation of each patient of massive weight loss, concerning good assessment of the deformity, distribution of skin redundancy history of stable weight for at least six months, good selection of technique for each case.

Intra operatively, meticulous hemostasis should be done, rectus plication with non-absorbable

sutures a layer of S.C fat above scarpa's fascia left to preserve some lymphatics the incision should be close in two layers.

Post-operatively, patients put in semi-sitting position and suction drain should be until 30cc or less of sero-sanguinous fluid found the drain mostly 48 hours, and IV antibiotic for 48 hrs. Followed by oral antibiotics for at least 5 days.

We recommend this algorithm when dealing with each case of abdominal redundancy after massive weight loss.

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## Meatal Based Flap with Plate Incision Covered by Dartos Fascia Flap for Distal Penile Hypospadias

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### ABSTRACT

A number of surgical procedures have been described to correct the distal penile hypospadias. The meatal based (Mathieu) Flap is popularly used to supplement the urethral plate with ventral shaft or preputial skin. A criticism of this repair is that the resultant meatus is horizontally oriented and rounded which is functional but cosmetically less desirable than normal. The Snodgrass technique is versatile, easy to do and has a good cosmetic outcome, with a vertically orientated meatus. A criticism of this repair is that frequencies of occurrences meatal stenosis and urethral stricture most of them need regular dilatation. So my idea is to do meatal based (Mathieu) Flap with incision of urethral plate and covering by fascial flap aiming to solve the criticism of both techniques. A total of 60 cases of distal penile hypospadias treated that technique and evaluated as regards the quality of the urinary stream and parents' satisfaction with function and cosmetic appearance and complication rate specially fistula and meatal stenosis. With 6 months follow-up. The age of the patients range from 1 year to 23 years. In all patients I use a urethral stent to travel the suture only not reach to bladder for 7 days. Postoperative edema was noticed in 6 (10%) patients who improve within few days. Postoperative infection was noticed in 1 (1.6%) patient the infection is mild and did not affect the repair. Cosmetically: Normal looking circumcised penis with good function (straight penis, urinary stream, near normal looking slit like meatus) with this repair. No (wound dehiscence, fistula, meatal stenosis, stricture urethra, stream abnormality, or penile torsion detected in any patients through follow-up period. As regards to operative time which estimated from the time of sterilization to the end of dressing between 60 to 90 minutes. In this study it was concluded that (in my hand) that technique is versatile, easy to do and has a good cosmetic outcome, with a vertically orientated meatus, as in a normal circumcised penis with no or less complication So this procedure, which benefits from the advantages of both the Mathieu and Snodgrass procedures.

### INTRODUCTION

Hypospadias surgery is challenging. To date more a numbers of surgical techniques with accompanying variation have been proposed for repair of hypospadias. Such repair should be simple, easily learned, applicable to the majority of cases, completed on one stage and resulting in good

function and cosmetic result with low complication rate. To date these repair not described [1].

In 1994, Snodgrass described a technique with a low complication rate for correction of distal hypospadias by tubularization of the urethral plate, combined with a deep longitudinal incision of the groove to create a vertical meatus. The advantage of this procedure is that it provides a generously mobile plate to form the neourethra with a vertical slit-like meatus [2]. Tubularized incised urethral plate technique is simple and provides good cosmetic results [3]. Brekalo et al., reported that, the Snodgrass technique is suitable for primary as well as after an unsuccessful urethral reconstruction [4]. However, the relatively high rates of meatal stenosis and/or urethrocutaneous fistula (0-33%) and the need for regular urethral dilation have always been a great concern with this procedure. These complications would be potentially more prominent in patients with a flat and narrow urethral plate [5,6,7].

Elbakry reported that regular calibration of the urethra is an integral part of Snodgrass technique for prevention of meatal stenosis [5].

Anani treat 58 patients of distal penile hypospadias by Snodgrass technique with resultant of 6 (10.3%) complicated by meatal stenosis treat by periodic urethral dilatation for three months with application of topical 0.05% betamethasone cream twice daily [8].

Urethrocutaneous fistula is the most common complication of Snodgrass technique with highest reported rate of fistula was 20% [5].

The meatal based flap, first described in 1932, for the reconstruction of distal hypospadias using paramental-based penile non-hairy skin, and since then it has remained one of the most reliable procedures in this context [9]. With complication rates