

## A retrospective analysis of complications of large volume liposuction; Local perspective from a Third World Country

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**Objective:** This study was aimed at evaluating the complications that occurred in patients undergoing large volume liposuction and to see if there was a correlation between amount of aspirate and the rate of complications.

**Methodology:** A detailed history, complete physical examination, BMI, and anthropometric measurements were documented for all patients. All patients underwent liposuction using tumescent technique under general anesthesia in Yusra General Hospital. Patients were discharged home after 24 to 48 hours. Pressure garments were advised for 6 weeks and were called for weekly follow up for 6 weeks. Pressure garments were advised for 6 weeks. Complications were documented. SPSS version 20 was used for analysis of data.

**Results:** Out of 217 patients, 163 (75%) were female and 54 male. Mean age was 37.1 SD±6.7

years. Bruising and seroma were most common complications; 4.1% and 2.3%, respectively. The incidence of infection was 0.9%. One patient had over-correction and four patients (1.8%) had under-correction. Significant blood loss was encountered in one patient. Two patients (0.9%) had pulmonary embolism and 2(0.9%) suffered from necrotizing fasciitis. None of our patients undergoing large volume liposuction had fat embolism and there was no mortality.

**Conclusion:** Careful patient selection and strict adherence to guidelines can ensure a good outcome and can minimize risk of complications. Both physicians and patients should be educated to have realistic expectations to avoid complications and improve patient safety. (Rawal Med J 201;43:77-80).

**Keywords:** Liposuction, obesity, subcutaneous fat, bariatric surgery

### INTRODUCTION

The modernization of society and changes in life style has resulted in ever growing problem of obesity not just in the first world but in developing countries as well. Obesity is the leading cause of chronic noninfectious diseases and WHO has described obesity as one of the "greatest public health challenges of the twenty first century".<sup>1-4</sup> Management ranges from diet and lifestyle modification to bariatric surgery and liposuction.<sup>2,3</sup> While the mainstay of surgical treatment for obesity is bariatric surgery, liposuction is more focused on body sculpturing and contouring.<sup>5</sup> Since the introduction of liposuction as a surgical option for removing subcutaneous fat in 1921 by Dujarrier, the procedure has rapidly undergone major changes, both in terms of surgical technique and equipment.<sup>6</sup> Liposuction nowadays is a minimally invasive procedure that can be performed under local anesthesia as an outpatient procedure.<sup>7</sup> With 77%

increase in the number of surgeries performed in the past 15 years, liposuction has evolved as the most common cosmetic surgical procedure.<sup>8,9</sup> In 2012, it was the second most common cosmetic surgery procedure performed by plastic surgeons in America.<sup>9</sup> Despite lack of consensus on the definition of large volume liposuction most surgeons accept that removal of more than 10% of total body weight in kgs, of subcutaneous fat is "large volume liposuction."<sup>10</sup> Despite being commonest aesthetic surgical procedure performed in the by plastic surgeons, many of the risks and postoperative complications are overlooked by physicians.

Literature review shows an overall complication rate of 8.6-20% with most common complication being contour deformity.<sup>5</sup> Other minor complications include by seroma formation, hyperpigmentation, asymmetry in size and shape, and hypertrophic scars.<sup>9,11</sup> Major complications

associated with risk of mortality include skin necrosis, infection, necrotizing fasciitis, pulmonary embolism, and have been reported in 0.02-0.25% of cases, while the mortality rate is 0.002%.<sup>5,9,11</sup> There is not much local literature available on complications of liposuction. This study was aimed at evaluating the complications that occurred in patients undergoing large volume liposuction and to see if there was a correlation between amount of aspirate and the rate of complications.

## METHODOLOGY

All male and female patients between ages of 25 to 60 years admitted to our surgical department, Yusra General Hospital, Rawalpindi, Pakistan between July 1st, 2014 and December 31st 2016 with obesity as defined by the WHO (BMI > 30 kg/m<sup>2</sup>), requesting liposuction were included in the study. Patients with co-morbidities making them unfit for general anesthesia, patients with hypothyroidism and patients with comorbidities related to renal, hepatic, gastrointestinal systems were excluded from the study. An Informed consent was taken from all patients.

A detailed account of history and complete physical examination, anthropometric measurements, and measurements of circumference of the areas to be liposuctioned as waist, hips, buttocks, thighs, calves and ankles was maintained for each patient. Patients had completed pre-operative baseline workup. Liver function tests, total protein, serum albumin, and serum cholesterol and triglyceride levels were also done as part of preoperative workup. General anesthesia was used for all patients. Prophylactic broad spectrum antibiotic was given preoperatively to all patients.

All patients under went liposuction using tumescent technique. After the surgeons had completed the procedure, constricting garments were applied to the patients' body to reduce edema and bleeding. Patients were discharged home 24 to 48 hours. Patients were called on weekly follow up for 6 weeks. Fortnightly follow up visits were done for 6 months. Pressure garments were advised for 6 weeks.

Complications that occurred intraoperatively were documented and early and late postoperative

complications noted on follow up visits were also documented in patients' charts. Repetition of the anthropometric and hematological measures was done at 6th week and at the end of the 3rd month and then at 6 months. SPSS version 20 was used for analysis of data.

## RESULTS

Out of 217 patients, 163(75%) were females and only 54 males. Their ages ranged from 25 years to 60 years (mean 37.1±6.7). Most of the females were under 50 years of age. Only 11(6.7%) female patients were above 50 years of age, whereas 7(12.9%) male patients were above 50 years of age. Their BMI ranged from 31 to 45 (mean 36.2±2.4). All patients had their HbA1C checked and was in the range of 5 to 9 (mean 6±0.9). Hypertension was present in 79 (36.4%) patients.

In our series, 4.1% patients had bruising post-operatively and was the most common complication. The second most common complication was seroma (2.3%). We had only one patient (0.4%) who developed a hematoma postoperatively. The incidence of wound infection (2 patients) and skin necrosis (1 patient) was 1.3%. In our study, one (0.5%) patient had over-correction leading to contour deformity in thigh, creating a discrepancy between the two thighs. Four patients (1.8%) complained of under-correction. None of our patients had complications related to scar and postoperative intractable pain. Two patients (0.7%) had a significant blood loss, which necessitated blood transfusion. None of the patients had clinically significant hypothermia. Two patients (0.9%) had pulmonary embolism. We had two patients (0.9%) who suffered from necrotizing fasciitis. Both these patients were diabetics with HbA1C >8. None of our patients had fat embolism. We found that complications were not related to amount of aspirate (p=8.4).

## DISCUSSION

Liposuction introduced as a surgical technique for contouring different regions of body has become a widely accepted procedure for weight loss and total body contouring.<sup>12</sup> It has gained popularity amongst general population as well as surgical community of

being simple, noninvasive and safe technique for obesity management.<sup>13</sup>

Using tumescent technique, approximately 1% of the aspirate is blood, which allows for large volume aspiration. In our study, we performed large volume liposuction removing up to 5L of fat, using tumescent technique, an average amount 4100 cc of infusate was used with an average aspirate amount of 8500 cc. The tumescent technique has been established as gold standard method of liposuction. A review of 127,961 patients undergoing liposuction in the U.S. in 2016 showed a 0.9% complication rate.<sup>14,15</sup> In ambulatory centers, no death occurred using tumescent liposuction.<sup>15</sup>

The results of our study are comparable to other studies in literature. Complications such as contour irregularities, infection, hypoesthesia, edema, ecchymosis, seroma, hematoma, skin discoloration especially at the site of cannulae insertions as well as more serious complications such as pulmonary embolism, viscus perforation, lidocaine toxicity or even death have been reported<sup>16-18</sup>

The overall complication rate including both local and systemic complications has been reported to be in the range of 8.6-20%.<sup>19</sup> Problems with contouring have been the most common complication with a reported incidence of 20%, however in our study only 2.3% patients had contour deformity.<sup>17,18</sup> Other minor complications included seroma, hyperpigmentation, asymmetry, and hypertrophic scar.<sup>19,20</sup> Although in our study we had a major complication rate of 2.3% and there was no mortality. Major complications including mortality reported in literature range from 0.02-0.25%.<sup>19</sup>

Results of our study were similar to literature showing seroma as second most common complication seen in 2.3% patients. In their study, Yi Xin Zhang et al including 4000 patients only 2% had complications.<sup>20</sup> Most surgeons have managed both these complications conservatively; in refractory and long standing cases of seromas, drains have been used to drain localized collections.<sup>20-22</sup>

According to various studies, the incidence of pulmonary embolism and/or deep venous thrombosis after liposuction is only <1%, but it accounts for 23% of post-operative mortalities and

is the most common cause of death following liposuction.<sup>19,21,22</sup> We had pulmonary embolism in only two patients (0.9%), which is comparable to literature. Both these patients recovered completely and there was no mortality in our study. Liposuction performed by trained physicians in carefully selected patients without contraindications has a mortality rate as low as 0.019%.<sup>23</sup>

We found that complications were not related to amount of aspirate (p=8.4). Proper patient selection was more important. Patients with comorbidities were found to be at greater risk of complication. Using super-wet technique up to 8% of body weight can be safely aspirated and avoiding liposuctioning too close to the dermis and muscle prevents complications.<sup>13</sup>

## CONCLUSION

Careful patient selection and strict adherence to guidelines can ensure a good outcome and can minimize risk of complications in large volume liposuction. Both physicians and patients should be educated to avoid complications and improve patient safety.

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