

Novel Method of Liposuction in Primary Lymphedema

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Abstract

Chronic lymphedema is a devastating problem for the patient and major financial and social burden. There are various medical and surgical management options available. One of the methods of treatment of chronic lymphedema is liposuction. We have used a novel modification of liposuction adhering to the principles to help in better aspiration of fat and fluid.

Keywords: primary lymphedema; liposuction; power-assisted liposuction (pal)

Introduction

Lymphedema is a chronic and important cause of lower limb swelling which is difficult to treat [1]. There are have been various treatment options to reduce size depending on the stage of the disease. Medical options include Complex Decompressive Therapy (CDT), compression garments, massage, elevation, exercise, Low-level LASER therapy (LLLT). Various drugs have been used both to treat the primary infection, prevent secondary infection and to reduce the limb circumference such as diethylcarbamazine, albendazole, diuretics, benzopyrones, various antibiotics (to treat and prevent secondary infections) etc. Surgical treatment includes both physiological and reductive or ablative procedures [2].

Physiological procedures may be lymphaticovenous shunt, nodovenous shunt, vascularised lymphnode transfer etc. In cases where these fail or may not be available, ablative procedures like liposuction, Charles procedure or Thompson procedure may be done.

Conventionally as mentioned in literature multiple incisions are by circumferential incisions in axial plane [3] (figure 1) this can leave out few blindspots.



Figure 1: Pre op image of left lower limb

We would like to discuss the novel technique of liposuction done in our patient as a part of our treatment.

Methodology

The present study was conducted in department of plastic surgery in a tertiary care hospital. The case under study is a 29 - year female patient presented with history of swelling of the left lower limb for 16 years duration without involvement of genitalia. Thorough evaluation of the patient done with lymphoscintigraphy, CT arteriography and venography, MRI of the affected limb. Limb volume measurement recorded pre operatively with volume displacement technique and tape measurements of the affected limb done.

Under tourniquet control 2 liters of standard tumescent solution was injected into the left lower limb using infiltration cannula. Power-assisted liposuction is used. Ten 3-mm-long incisions are made over the limb on the lateral aspect to facilitate infiltration and later suctioning of the fat was done (figure 2). First the postero-lateral midline of the limb was marked and three incisions made along this line on the leg and three on the thigh. 3cms below this line another line was drawn parallel to it where two incisions marked to give a zig-zag pattern. Liposuction was performed using 15 and 25 cm long cannulas with diameters of 3 and 4 mm (figure 2-3).



Figure 2: Skin makings of incisions



Figure 3: Skin marking with modified incisions

About 1.5L of lipoaspirate was removed from the affected limb. Ports were left open for draining the fluid. Compression bandage was applied which was changed once every three days (figure 4).



Figure 4: Compression bandage applied.

Results

Reduction of limb size was noted in the immediate post-operative period. Quantification of the same was done with limb girth measurements. A difference of 2cms was noted. (Figure 1 & 5) Patient did not develop any complications.



Figure 5: Limb after liposuction

Discussion

Chronic lymphedema treatment may be combined with liposuction along with other conservative modalities when physiological procedures are not adequate or are not feasible. Liposuction for lymphedema is performed axially with respect to the axis of the limb. This will prevent damage to the existing lymphatic vessels within the limb.

Greene et al evaluated the effects of liposuction in one patient with primary lymphedema affecting the leg, and two patients with secondary lymphedema [4]. Postoperative lymphoscintigraphy revealed that two of the patients had reduced dermal backflow, and one had new transit and uptake of tracer to epitrochlear nodes. Using bioimpedance spectroscopy, Boyages et al found that after liposuction for lymphedema the extracellular fluid was reduced, suggesting improved flow of the lymphatic fluid [5]. Together these studies suggest that lymphatic fluid transport may actually improve following liposuction. Another study investigating the effect of liposuction on skin blood flow in patients with lymphedema using laser Doppler imaging found that skin blood flow increased significantly to values similar to the normal arm following liposuction [6]. The reduced incidence of cellulitis may be explained by the improvement in lymphatic fluid flow and skin blood flow following liposuction. In a recent study, liposuction in 130 patients with arm lymphedema reduced the incidence of cellulitis from 534 bouts of cellulitis per 1,147 observation years before to 60 bouts of cellulitis per 983 observations years after liposuction, a reduction of 87% [7]. The possible complications include bleeding, skin necrosis, infection, etc.

All these studies support the role of liposuction in lymphedema patients. In the classical description given it is noted that the liposuction has to be done axially and circumferentially along the limb. This might cause few blind spots to be left out between the incisions. Hence we have used incisions as steps (zig-zag manner) to help in crosshatching and preventing blind spots.

Conclusion

We have devised a novel way of doing liposuction in lymphedema in achieving better and effective results. However large, randomized control trials are required to substantiate the results.



Declarations

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Authors' contributions

All authors made contributions to the article

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Conflicts of interest

None.

Consent for publication

Not applicable.

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